ROUTLEDGE STUDIES IN LABOUR ECONOMICS

Youth and the Crisis

Unemployment, education and health in Europe

Edited by
Gianluigi Coppola and Niall O'Higgins

ROUTLEDGE

Youth and the Crisis

The recent recession has led to an ongoing crisis in youth labour markets in Europe. This timely book deals with a number of areas related to the context, choices and experiences of young people, the consequences of which resonate throughout their lives. The focus of the contributions to this volume is on issues which, whilst undoubtedly important, have thus far received less attention than they arguably deserve.

The first part of the book is concerned with issues related to education and training, covering matters such as the role of monopsony in training, the consequences of over-education, and the quality of educational institutions from primary to tertiary. The second part is primarily concerned with the long-term consequences of short-term choices and experiences, including contributions on health-related choices, health consequences later in life, factors affecting the home-leaving decision, as well as an analysis of the increasing intergenerational transmission of inequality – a trend which accelerated during the recession. The final part of the book deals with issues related to youth unemployment and young people not in education, employment or training (NEET) – the direct consequences of the recession.

This book contains a number of innovative analyses reporting significant findings that contrast with standard models. Some of the more interesting results directly contradict conventional wisdom on a number of topics, from the importance of monopsony in training markets to the importance of transitory income changes on consumption of addictive goods. This book is suitable for those who study labour economics and the political economy, as well as employment and unemployment.

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Routledge studies in labour economics

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Routledge
Taylor & Francis Group
LONDON AND NEW YORK

First published 2016
by Routledge
Park Square, Milton Park, Abingdon, Oxon OX14 4RN

and by Routledge
711 Third Avenue, New York, NY 10017

Routledge is an imprint of the Taylor & Francis Group, an informa business

British Library Cataloguing in Publication Data
A catalogue record for this book is available from the British Library

Library of Congress Cataloging in Publication Data
Youth and the crisis : unemployment, education and health in Europe / edited by Gianluigi Coppola and Niall O'Higgins.
pages cm
1. Youth--Employment--Europe. 2. Unemployment--Europe. 3. Labor market--Europe. 4. Manpower policy--Europe. 5. Europe--Economic conditions I. Coppola, Gianluigi, editor. II. O'Higgins, Niall, editor.
HD6276.E82Y664 2016
331.3'4094--dc23 2015024834

ISBN: 978-1-138-89777-9 (hbk)
ISBN: 978-1-315-70899-7 (ebk)

Typeset in Times New Roman
by Sunrise Setting Ltd, Paignton, UK

Contents

Figures

Tables

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Acknowledgements

Gianluigi Coppola and Niall O'Higgins want to thank all of the authors for their timely contributions and revisions, to a substantial team of anonymous referees and to participants at the workshop 'Youth and their Future: Work, Education and Health', held at the University of Salerno on 17–18 October 2013 where the idea for this book was born and at which many of the contributions here were presented. They also acknowledge financial support for the Workshop from the Department of Economics and Statistics (DISES) and the Centre for Labour Economics and Political Economy (CELPE) of the University of Salerno, Italy.

Thanks also to Carlo Paolucci for his excellent editing support.

1 Editors' introduction

Niall O'Higgins and Gianluigi Coppola

This volume is concerned a number of issues related to the entry of young people into the labour market. It is a tough time to be a young European seeking to enter the world of work – it can reasonably be argued that young people have been particularly hard hit by the recession – and a number of the chapters included here are directly concerned with the effects of the recession on young people's choices. More generally, the contributions to this volume treat issues which, whilst undoubtedly important, have thus far received less attention than they arguably deserve.

Experiences and choices made early on in life can have long-lasting consequences. What happens to young people in the labour market upon entry, including extended spells of unemployment, is likely to have repercussions which will be felt throughout their adulthood (O'Higgins 2001). It has long been recognized that unemployment is associated with a series of negative health consequences, both physical and psychological, which tend to grow disproportionately with the duration of unemployment.[1] The first part of this book is concerned with various aspects of education and training, an area which has long been recognized as having long-term consequences on the experiences of its recipients. The second part of the book contains several chapters looking the longer-run consequences of choices and experiences of young people. The final part of the book examines labour market outcomes in more detail focusing on different aspects of unemployment and non-employment amongst young people, particularly in the context of the economic crisis.

Before looking further at the content of the chapters presented here, it is worth outlining briefly some of the major trends associated with the recession.

Some context: the recession and youth labour market outcomes

First, although youth unemployment rates increased significantly during the recession, the main way in which young people may be said to have suffered disproportionately from the crisis is not directly related to unemployment rates *per se*. Figure 1.1 illustrates the percentage change in the major labour market indicators for young people between 2007 and 2014. Over this period the unemployment rate for youth (aged 15–24) in the EU increased by 41 per cent, whilst the rate for prime-age adults (25–49) increased by 53 per cent.[2]

Consequently, the ratio of youth–adult unemployment rates actually fell over the same period. True, the percentage *point* increase in youth unemployment rates (6.4 percentage points) was nearly double that of prime-age adults (3.4 percentage points), but this simply reflects the tendency for unemployment rates to be higher for young people than adults, irrespective of the state of the economy. The reasons for this are well known and will not be entered into here,[3] but the obvious consequence is that a given *percentage point variation* will correspond to a much smaller *percentage variation* for young people than for adults – thus the percentage point variations are likely to be higher for young people than adults as a consequence of both positive and negative demand shocks.

On the other hand, the prevalence of long-term unemployment[4] amongst young people increased by 35 per cent (compared to an increase of 13.5 per cent for adults); youth employment fell by over 13 per cent (compared to a fall of 3 per cent for adults); and the prevalence of temporary and especially part-time employment amongst young people also increased more than for adults.

None of these changes can have been particularly welcome to young people. However, the increase in long-term unemployment is of particular concern. Following a period in which it had been persistently, albeit gradually, falling amongst young people, the recession precipitated a rapid and sustained growth in this indi-

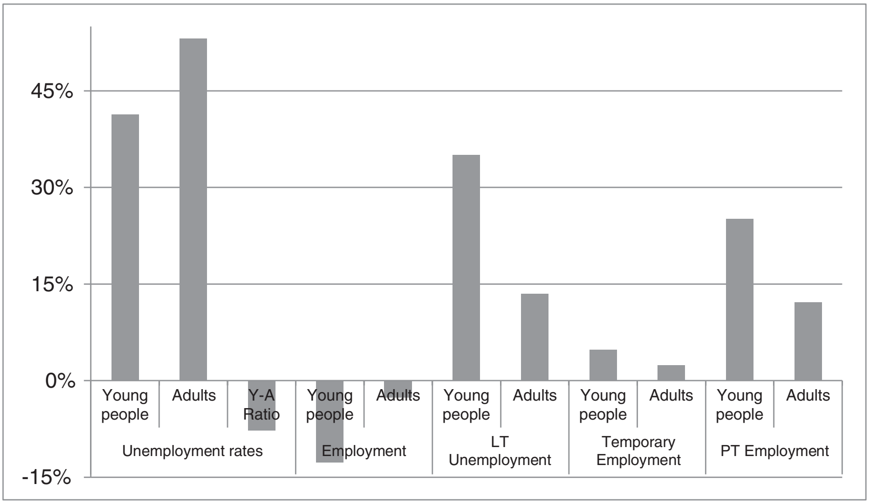

Figure 1.1 Percentage changes in labour market indicators for young people (15–24) and adults (25–49) in the EU28, 2007–14

Source: Calculated form Eurostat data (http://epp.eurostat.ec.europa.eu/).

Notes: The Y-A ratio is the ratio of youth unemployment rates to adult unemployment rates; L-T is long-term unemployment (over 1 year). The final three bars on the right report the percentage change in the prevalence of the phenomena calculated as a percentage of the young unemployed (for long-term unemployment) or young employees (temporary and part-time employment).

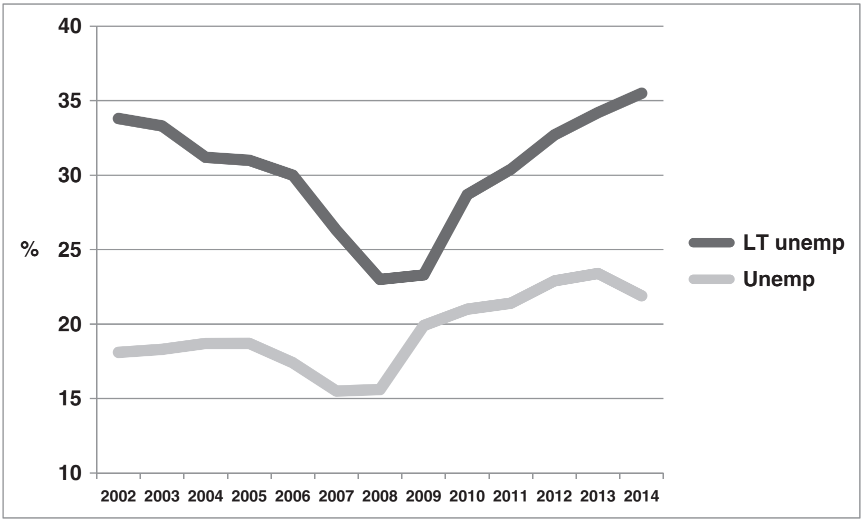

Figure 1.2 Youth unemployment rates and the prevalence of long-term unemployment amongst young people, 2002–14

Source: Calculated from Eurostat data (http://epp.eurostat.ec.europa.eu/).

Note: The prevalence of youth long-term unemployment is calculated as a percentage of the young unemployed.

cator (Figure 1.2). The EU-wide youth unemployment rate, following a big jump between 2008 and 2009, has since levelled off, and in 2014 actually fell. The prevalence of long-term unemployment, however, grew at a much faster rate during the recession and continues to grow even as youth unemployment starts to recover.

A number of papers over the years have noted that the effects of unemployment and/or joblessness early on in one's 'working' career are likely to have long-term effects on employment prospects and wages (e.g. Gregg 2001; Gregg and Tominey 2005).[5] The regularity with which such scarring has been found as well as more recent attempts to control for selectivity effects suggest that there really is a scarring effect that goes beyond unobserved individual heterogeneity (e.g. Cockx and Picchio 2013). The implication is that extended difficulties in the search for work early on are likely to have long-term negative consequences.[6] In the context of the current prolonged recession, this creates the spectre of a lost generation of young people who become permanently excluded from productive employment (Scarpetta *et al*. 2010). This is a real problem; and one which has prompted the recent resurgence of interest in youth guarantee schemes in the EU.

This overall picture conceals much cross-country variation. For example, between 2007 and 2013 the prevalence of long-term unemployment amongst the young unemployed almost quadrupled in Spain, almost tripled in Latvia and nearly doubled in Ireland and the UK, whilst it actually fell in six EU countries, most notably in Germany where the reduction was almost 30 per cent. Unemployment and long-term unemployment are of course also not spread evenly across young people with

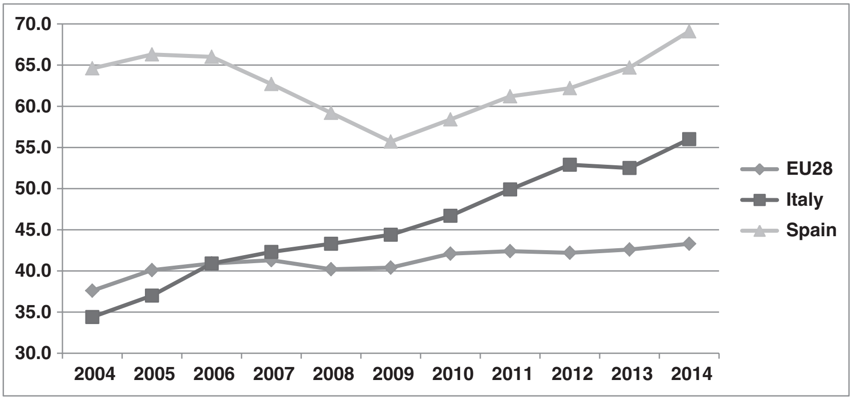

Figure 1.3 Prevalence of temporary employment in the EU, Spain and Italy, 2000–14

Source: Calculated form Eurostat data (http://epp.eurostat.ec.europa.eu/).

Note: The prevalence of temporary employment amongst young people is calculated as a percentage of the young employed.

different characteristics. For example, in the UK in 2014, the unemployment rate was 16 per cent for young (16–24-year-old) whites, 25 per cent for young Asians and 32 per cent for young blacks – twice the rate for young whites.[7] Unemployment also tends to be concentrated amongst the less educated in the EU. In 2013, the unemployment rate for young adults[8] (25–29) with lower secondary education or less was over double (29 per cent) that of young adults with secondary (13 per cent) or tertiary education (11 per cent).

Although the average increase of 5 per cent in the prevalence of temporary employment amongst young people across the EU between 2007 and 2014 is rather moderate (Figure 1.3), this too hides substantial cross-country variation. For example, in Italy the recession has reinforced an ongoing trend in increasing 'flexibility at the margin' initiated with major labour market reforms in 1997 and 2003; during the recession, the prevalence of temporary employment amongst young people increased by 32 per cent in Italy, so that now temporary forms of employment account for well over half all employment contracts of young people (56 per cent in 2014) and practically all new youth employment contracts (O'Higgins 2011). Also, the prevalence of part-time employment amongst the young employed rose significantly, by 25 per cent in the EU and by 62 per cent in Italy, between 2007 and 2014. Clearly a significant part of the fall in aggregate labour demand was translated into reduced working time for the young.

Education and training

Education and training have long been recognized as being central in determining young people's, and consequently also adults', labour market outcomes. Part I of this book contains contributions concerned with various aspects of this area. Often the idea underlying the contributions is to take a look at an area of study which has not been examined in great detail in the literature, but which is of clear relevance to young people's experiences. Thus, in the next chapter, Paul Ryan examines an issue which has hitherto been understudied, monopsony and training. The issue of monopsony in labour markets in general has gradually become more prominent in the literature, particularly following the publication of Manning (2003) but with significant contributions also during the 1990s, above all from Card and Krueger (1994, 1995) and, of more immediate relevance to Paul Ryan's chapter, from Margaret Stevens (1994) who considered a theoretical model of training in the context of an imperfectly competitive (skilled) labour market. In his primarily empirical chapter, Ryan looks at the evidence on monopsony in training markets themselves. In an attempt to get beyond the black box approach to vocational training, Ryan provides convincing evidence for the existence and relevance of monopsony in the training markets. This is followed by a more conventional review chapter on the important issue of overeducation in youth labour markets by Caroleo and Pastore. Looking at the opposite issue – university dropout – Roberto Zotti undertakes an innovative analysis on the role of university – in addition to the more conventionally analysed individual – characteristics in determining university dropout behaviour. The chapter suggests that, although individual characteristics are more important in determining the dropout choice, two university-level characteristics are important in driving student dropout: the geographical fragmentation of individual universities as well as the number of three-year degree courses offered by universities following the 2001 Italian university reform. The latter finding is perhaps of particular significance inasmuch as one of the main justifications for the introduction of three-year degrees (the 'Bologna process') was precisely the idea that this would reduce student dropout. Part I ends with an interesting contribution from Conti *et al*. on school quality at the primary level. The chapter begins by stressing the cumulative nature of learning and the consequent, as well as empirically validated, albeit often ignored, relevance of the quality of primary education in determining young people's educational attainment and hence the quality of young people's labour market outcomes. The authors then undertake a multi-level analysis to examine the relative importance of individual, school-level and geographical factors in determining pupil attainment. Whilst individual and family background characteristics are clearly of primary importance, school quality does play a significant role, and the authors are able to establish that the poor performance of remote schools is determined by their typical characteristics as opposed to their location *per se* – a finding with important policy implications.

Short-term choices with long-term consequences

The book then continues with a series of chapters looking at factors present in youth which have lifelong consequences. Again the focus is on some of the areas less studied. Three of the chapters in Part II are concerned with health-related issues. Coppola *et al*. present a theoretical model and empirical estimates focusing on the effects of transitory income changes on health and health-related behaviour. The authors find substantial differences by gender in the effects of wage changes on behaviour. Furthermore, the results suggest the existence of effects of income changes in the consumption of alcohol and, to a lesser extent, cigarettes which are inconsistent with the standard neoclassical utility maximization model according to whether wage changes are negative or positive. The authors suggest that such effects can be explained in the context of a rational addiction type model and hypothesize that it may be the shock of the wage change itself, rather than its sign, which provokes recourse to 'anxiety'-relieving goods such as alcohol and cigarettes.

The second chapter in Part II, by Bruno *et al.*, is concerned with the effects of obesity amongst young people on their labour market outcomes, and, in particular, on the quality of employment as measured by various dimensions of job satisfaction. Whilst the authors do not find an overall effect of overweight or obesity, they do find strong evidence of gender differences in the effects of obesity and overweight on different dimensions of job satisfaction. Orietta Dessy, on the other hand, looks at the long-term consequences for health of unemployment spells experienced during youth. Taking all European countries together, she finds that youth unemployment spells are associated primarily with deteriorations in mental health amongst the over-50s. However, when considered on a country by country basis, she finds that youth unemployment is associated with poor physical health later in life in Germany, Denmark, Austria, Belgium, the Netherlands and Italy; and with deteriorating mental health in older persons in France, Belgium, and Spain.

The rising age of leaving the parental home has been an issue of some concern both amongst both policy-makers and researchers, particularly since the dawning of the new millennium. Two chapters in Part II examine the factors underlying the home-leaving decision by young people. Modena and Rondinelli find a significant role of house prices in determining the decision for both young men and young women in Italy, at the same time finding very clear gender differences in behaviour: whilst for young men the home-leaving decision is clearly associated with the end of participation in education, for young women the decision is evidently linked to their traditional role as in-house service providers. Thus, for example, young women typically remain at home when they live with only a male parent. Mazzotta and Parisi, on the other hand, look at the effects of the recession on the home-leaving decisions and poverty amongst young people in Southern European. They find that the recession did indeed have a clear effect in raising the home-leaving age in Spain, Portugal and Italy. At the same time the decision to leave home both before and after the crisis is also positively associated with family income and education; moreover, there is a strong, and slightly more complex, association between poverty and leaving home. That is, young people from poor backgrounds are less likely to leave home, but at the same time are more likely to live in poverty if they do. Finally, Federica Roccisano looks explicitly at the issue of intergenerational mobility implicit in Mazzotta and Parisi's chapter. The paper finds clear evidence of the intergenerational transmission of income in Italy associated with low levels of intergenerational mobility. This situation is very severe when compared with other European countries but has also worsened in Italy over the last decade, and the author attributes it to the lack of effective labour market opportunities associated primarily with the worsening of the labour market situation of young people associated with the progressive introduction of labour market 'reforms at the margin' since the second half of the 1990s – a lack of opportunities which has been further exacerbated by the economic and financial crisis.

Youth unemployment, NEET and the crisis

Part III contains three chapters concerned with youth unemployment and people who are not in education, employment or training (NEET). Mussida and Sciulli look at gender differences in the probability of leaving unemployment amongst young Italians aged 15–34 using the 1985–2004 WHIP data set. They estimate the hazard rates of the young people by exit contract type, and they apply a decomposition analysis with the aim of investigating the sources of the raw differentials, distinguishing between the respective roles of characteristics and their remuneration. The results show that, with one or two exceptions, females have lower re-employment probabilities than males across a range of characteristics. Females living in the Southern regions are those experiencing the greatest raw differential (40–50 per cent) compared to males, whether one considers transitions to permanent or atypical (temporary and similar) contracts. Moreover, the lower exits of women to permanent employment are explained by the lower returns to women in these types of job, providing clear evidence of discrimination against young females operating in the attribution of such contracts. On the other hand, the lower re-employment probabilities of women into the less desirable atypical contract forms suggest selection on 'productivity-related' characteristics with no evidence of discrimination.

The subsequent chapter by Bruno *et al*. investigates and compare the responsiveness of male and female youth unemployment and NEET rates, as well aggregate unemployment rates, to GDP. The main focus is on the changes that occurred during the crisis (2009–11) with respect to the previous period. Using a more sophisticated dynamic generalized method of moments framework, the authors largely confirm the results of O'Higgins (2014), identifying differences in GDP responsiveness which may be attributed to difference in labour market institutions broadly interpreted. Over the crisis period (2009–11) the best performance was recorded in Continental and Northern regions, while the worst changes can be found in the Southern region and and among new member states. The main empirical outcomes are that institutions and policies similar to those adopted in Continental Europe, especially in Germany, are especially apt to minimize the impact on labour markets and, concerning the Southern regions, the high persistence of NEET and youth unemployment rates – both male and female – and the low responsiveness to GDP mean that, even when the economy does recover, many years will elapse before the situation of young people might improve, unless they rapidly adopt effective structural policies.

One of the issues considered by Bruno *et al*. in their chapter was the difference (in the response to variations in GDP) of youth NEET and unemployment rates. But just how useful is the concept of NEET now being so enthusiastically adopted by a number of international agencies, most particularly the OECD and the European Commission? The book concludes with an interesting and provocative discussion on the concept of NEET by Guido Cavalca. A number of papers in recent years have argued in favour of broadening the concept of unemployment to include those not actively seeking work and/or to extend it to include all those who do not participate in education or training (e.g. O'Higgins 2001; World Bank 2006; and, most recently, O'Higgins 2015). This chapter takes a more critical position with respect to the indicator. In particular, Cavalca joins with Furlong (2006) in arguing that the concept is both too broad, in that the NEET include within their ranks a number of very different types of individual, and too narrow, since it does not include some arguably vulnerable categories of young people – specifically, those in temporary and other atypical forms of employment. Cavalca ends by suggesting the use of multiple indicators in order to identify and address the problems of vulnerable young people so as to reduce social inequalities.

Notes

1 See Bell and Blanchflower (2010) and, in particular, the references cited therein.
2 All the figures and calculations reported here are based on the Eurostat database.
3 See, for example, O'Higgins (2001) and/or Ryan (2001) for a discussion.
4 The prevalence of long-term unemployment is defined here as the percentage of the unemployed of a specific age group who have been unemployed for 1 year or more.
5 The paper cited provides perhaps the strongest case for duration dependence, looking at the effects of early unemployment on career prospects some ten-fifteen years later, controlling for observed heterogeneity.
6 Gregg and Tominey (2005) identify a scarring effect on wages more than twenty years after unemployment episodes experienced during youth.
7 The designations white, Asian and black are those used in the briefing note from which the figures were taken (Dar and Mirza-Davies 2015). Labour force statistics on ethnic minorities (as opposed to immigrants) are not (yet) routinely reported by Eurostat.
8 Since a substantial proportion of young people as traditionally defined (15–24) are still in education, particularly if they are proceeding to upper secondary and tertiary education, the unemployment rates of this age group by education will give a misleading interperetation. Even for young adults, the unemployment rates may be misleadingly high for tertiary graduates; however, the figures serve to make the basic point. See, for example, O'Higgins (2010: 23) for a discussion.

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Part I

Education and training

Choices and outcomes

2 Monopsony power and work-based training

Paul Ryan

Introduction

The implications of monopsony power in skilled labour markets are central to modern labour economics. The costs of information and mobility, which generate imperfect competition for labour by employers, are widely taken to explain the otherwise paradoxical willingness of many employers to invest in skills that are readily transferable to other employers (Stevens 1994; Acemoglu and Pischke 1999).

'Monopsony power' denotes here situations of multi-employer, imperfectly competitive markets, in which information and mobility frictions weaken inter-employer competition, so that the individual employer can offer low pay without losing its entire supply of labour. In traditional parlance, the firm faces a rising supply price of labour (Manning 2003, 2011).

The possibility that monopsony power may also be present in training markets has, by contrast, been neglected. Employers who provide long-term training to young people may possess monopsony power – for similar reasons of information and mobility cost, as well as for the traditional reasons of market segmentation, fewness of competitors, and collusion between employers. The economic implications of monopsony power in training markets remain largely unexplored.

This chapter considers the implications of monopsony power in both skilled labour markets and training markets. The two contexts are taken to be linked by the existence of occupationally defined intermediate-level skills, as defined by national systems of apprenticeship training. 'Apprenticeship' is taken to denote all so-called dual training programmes, combining classroom-based part-time vocational education with training and work experience at the workplace and geared to certified intermediate skills. It excludes simple on-the-job training and full-time vocational education in educational institutions. It represents in Germany and Switzerland in particular the principal vehicle for school-to-work transitions (Wolter and Ryan 2011).

Training markets are labour markets in which the exchange of labour services for pay is accompanied by the provision of training services by employers. They match the supply of apprenticeship places by employers to the demand for places by young people. They are defined primarily by occupation, the level at which training requirements are externally defined and qualifications are made available. Demand and supply are taken to be well-behaved functions of price. If the content of training is standardised across employers, apprentice pay provides an inverse indicator of price: the lower trainee pay, the higher the price of training (to the trainee; Stevens 1999; Ryan *et al*. 2013). Failing any external regulation of training content, the price of training has two dimensions, viz., pay and content: lower training content, for given trainee pay, indicates a higher price to the trainee.

The evidence on monopsony power in training markets has attributes similar to that for labour markets in general. Direct evidence does exist but is limited in terms of availability and conclusiveness. Indirect evidence is accordingly important, in that the assumption of monopsony power leads to plausible explanations of empirical regularities that cannot readily be explained within the perfect competition paradigm. Thus the effect of collective action by apprentices in training markets resembles the effect of statutory minimum wages on employment in low-wage labour markets: both provide indirect evidence of monopsonistic competition (Manning 2003).

The conclusion is not that monopsony power is necessarily universal in training markets, though at low levels of intensity it may well be as widespread as it appears to be in labour markets (Boal and Ransom 1997). It is rather that the economic theory of training requires generalisation in order to embrace both the possibility of monopsony power in training markets as well as skilled labour markets, and that of greater monopsony power in training markets than in skilled markets. Such market structures prospectively shift employers from investment-oriented to production-oriented reasons for providing training. More generally, the prospective result is some convergence between the economic theory of training and long-standing sociological-cum-political criticisms of youth employment and training in market economies (Gollan 1937; Carter 1966; Lee *et al*. 1990).

The next section considers economic theories of work-based training. It is followed by a discussion of the potential sources of monopsony power in training markets. The section after that analyses evidence of monopsony power in training markets. Four types of evidence are considered: statistical associations between the number of employers and the pay of apprentices across local labour markets in contemporary Switzerland; qualitative analysis of patterns of apprentice pay and economic-institutional determinants in the UK, Germany and Switzerland; patterns of surplus acquisition during training by employers in Germany and Switzerland; and the effects of industrial action by apprentices in the UK in the last century.

The economics of work-based training

The economics of training has been dominated since the 1960s by human capital theory. Assuming perfect competition in all markets, i.e., that all skills are ‘general’, Becker (1964) predicted that work-based learning will be financed entirely by the trainee, primarily through forgone earnings during training. Trainees will be paid the value of their marginal product, net of the direct costs to the employer of training them.

The prediction is striking and the intuition is simple. No employer could subsidise trainees, i.e., pay them more than their net marginal product, and stay in business: in order to recoup its investment in training, the firm would have to pay its skilled workers less than their marginal product. If it did that, it would lose them all to employers who do not invest in training and can therefore pay the market rate for skilled labour. Consequently, employers provide training only as long as they do not have to invest in it.[1]

The prediction has faced an anomaly: some employers appear to finance general training, at least in part. In the second generation of human capital theories, that anomaly has been resolved by assuming that skilled labour markets involve imperfect, not perfect, competition. Competition for skilled workers is assumed to be less than intense, so that pay differences between employers do not induce wholesale quitting. The firm can then invest in training, as it can pay skilled employees less than their marginal product without causing all to quit. Indeed, if the training market is assumed to remain perfectly competitive, the firm *must* invest in anyone it trains: potential trainees will accept a training place only if paid enough to compensate for having subsequently to share the return to training.

The potential sources of monopsony power in skilled labour markets include both the traditional ones (fewness of employers and collusion by employers, sustained by the costs to workers of job mobility) and the 'modern' ones (information costs and matching frictions). In the modern approach, information is assumed asymmetric, either between employers about the quality of individual workers, or between individual workers and employers about the content of training programmes. Alternatively, the differentiation of production methods and skills requirements across employers is assumed to mean that in only a few firms can trained workers use to the full the skills that they have acquired. All these factors create a wedge between the marginal product and the pay of trained workers by worsening their outside options, thereby allowing the firm to recoup its investment in general training (Stevens 1994; Acemoglu and Pischke 1998).

Most second-generation human capital theories combine an explicit, non-Beckerian assumption of monopsony power in skilled labour markets with an implicit, Beckerian assumption of perfect competition ('free entry') in the training market. The result is wage compression: a pay structure in which training raises workers' pay by less than it does marginal product, giving the employer both the scope and the incentive to invest in training.

Some models do assume instead that trainee pay is set by collective bargaining or minimum-wage laws, not by perfect competition. Trade unions and wage regulations are typically assumed to reduce pay differentials between unskilled and skilled employees. This increases wage compression and strengthens the firm's incentive to finance general training (Acemoglu and Pischke 1999).[2] Nevertheless, the combined assumption of monopsony power in skilled labour markets and perfect competition in training markets remains central to contemporary human capital theory (Wolter and Ryan 2011).[3]

Monopsony in training markets: sources

'Monopsony power' denotes here not that textbook rarity, a market with a single employer, but rather a situation in which the supply of trainees to the firm is less than infinitely elastic with respect to the training wage (given training quality).[4] In the simple static single-employer model, the employer maximises profit by lowering trainee pay below the perfectly competitive, market-clearing level, doing so until that entails losing too much of its supply of trainees. Such a market can involve stronger or weaker competition, but not perfect competition, between employers. Alternative terms for such situations are 'monopsonistic competition' and 'oligopsony' (Manning 2003, 2011).[5]

Two types of monopsony power were distinguished above: the traditional and the 'modern'. The potential sources of both are now discussed in sequence. The traditional sources include fewness of employers and collusion between employers. Both must be underpinned by costly labour mobility, occupational or geographical (Boal and Ransom 1997). The latter assumption is particularly plausible for apprentices. They mostly live in and are financially dependent on the parental household. Ties to family and peer group confine many of them to local labour markets in which few employers compete for their services. Employers may also collude to avoid competing on pay to recruit apprentices.

Even so, one might expect the competitiveness of training markets to be high in that, before training starts, prior occupational affiliations do not constrain employers from competing across occupations and sectors to recruit trainees, as is typically the case for skilled workers. If, however, potential trainees already have occupational preferences for training (e.g. for hairdressing or car repair), that may still curb recruitment prospects for the individual employer. Moreover, after training starts, the cost to the trainee of moving employers becomes high relative to that in regular youth employment (Muehlemann, Ryan and Wolter 2013).

Modern theories of monopsony centre on asymmetric information (Manning 2003). In training markets, the principal potential asymmetry is that between employers and trainees, concerning the content of training programmes. The employer may be assumed to know the content of its training programme, and the potential trainee to have only imperfect knowledge, associated with difficulty of observing *ex ante* (from outside) the scope and quality of work-based training. Information failure can also be *ex post* (i.e., present during training), because of the difficulty for the trainee of assessing the value of the training being provided.

When such informational asymmetries are substantial, for a given price of training, the profit-maximising monopsonistic employer offers low training quality (i.e., limited training content), as leading to low cost and high profit. (Under costless information, high trainee pay would result, compensating young people for low training quality in order to ensure a supply of trainees.) This moral hazard potentially flourishes in unregulated training markets as the employer cannot then commit credibly to providing any minimum content of training, even if it wants to. The defect can be reduced by the external imposition of minimum training standards but not completely, as asymmetric information about training content affects external regulators as well as trainees. Employee representation rights at the workplace also offer a partial antidote (Ryan 1994; Smits 2005; Lewis and Ryan 2009; Dustmann and Schönberg 2009, 2012).

The factors that create a plentiful supply of trainees despite low pay potentially overlap with those that make the supply of trainees to the firm less sensitive to pay. For example, youth ties to a locality can create a captive supply of apprentice labour for local firms, whose fewness then makes it easier for them to collude to avoid price-based competition for trainees.

A full analysis of monopsony power should be dynamic, involving inflows to and outflows from training. In training markets it should also incorporate the cost of recruiting apprentices, not just that of training them (Manning 2003, 2006). The dynamic aspect of monopsony concerns the responsiveness to apprentice pay of both recruitment into training and quitting during training. Employers may be expected often to possess monopsony power in the latter respect, at least *ex post*, given that quitting during training potentially damages the apprentice's prospects for gaining a skilled qualification and achieving career success.

In a dynamic formulation, the strength of monopsony power depends not just on the wage elasticity of trainee labour supply to the firm, but also on whether the marginal cost of recruiting apprentices rises with the number recruited. If marginal labour cost, defined as combining the effect of hiring another apprentice on both the apprentice wage and recruitment cost, increases with the number recruited, the firm enjoys monopsony power in the training market (Manning 2006).

A distinction must be drawn between the factors that promote a high demand for training places even at low pay rates, which would generate low apprentice pay even under perfect competition, and those that allow employers to pay even less as a result of monopsony power. The former category includes high youth unemployment and weak demand for youth labour even in unskilled jobs, and the rationing of both admissions and financial support in full-time education, both general and vocational. Such factors potentially create a large supply of young people to apprenticeship at low pay rates.

Moreover, monopsony power may not be present in a training market in the first place, whether because information asymmetries are limited, or because many employers compete on pay for trainees. Alternatively, monopsony power may exist but be neutralised, as in models of bilateral monopoly, because employee representation (trade unions, works councils) prevents low pay and low training quality.

The typical neglect of monopsony power in training markets by economists may reflect the conventional assumptions that (i) the categories 'trainee' and 'unskilled worker' are fungible, and (ii) competition is stronger in markets for unskilled labour than in other labour markets. These assumptions may be appropriate for the on-the-job training of adults in the USA, in which the typical trainee is an adult with prior labour market experience. The apprenticeship systems of continental Europe differ, however, in that most trainees are inexperienced young people who have only recently left full-time schooling and still live in the parental household. The range of employers competing for them is therefore likely to be smaller, and their dependence on the employer providing training greater, than in the training of adult employees. The implication is more monopsony power in training markets than in unskilled labour markets.

Monopsony in training markets: evidence

Evidence on monopsony power in training markets is, like that for labour markets generally, largely indirect and suggestive, rather than direct and conclusive. No estimates of the elasticity with respect to apprentice pay and training quality of the supply of potential trainees to the firm are available as yet. Estimates of the structure of recruitment and training costs – in particular, whether marginal cost rises with training volume – are a recent development, hampered by a lack of exogenous variation in training volume at firm level (Blatter *et al*., 2012; Muehlemann, Pfeifer and Wenzelmann 2013).

This section discusses four sources of evidence suggestive of monopsony power in training markets: territorial variation in the pay of Swiss apprentices; the relative pay of apprentices in German, British and Swiss metalworking crafts; training-related surplus acquisition by German and Swiss employers; and the effects of collective industrial action by metalworking apprentices in the UK. The first source involves direct evidence on a traditional variant of monopsony power; the other three, indirect evidence on some mix of traditional and 'modern' variants.

Fewness of employers and apprentice pay: local labour markets in Switzerland

Muehlemann, Ryan and Wolter (2013) investigate the association of apprentice pay with one of the traditional sources of monopsony power: fewness of employers. Employers who face fewer competitors for trainees in local labour markets are expected to pay lower wages. Three labour markets are distinguished: for skilled workers, i.e., those who have completed a skilled qualification in an occupation recognised for apprenticeship training; for 'unskilled' workers, i.e., employees in sub-skilled occupations in the same sectors who lack such a qualification; and training markets for apprentices.

The dependent variable is the relative pay of the various permutations of two groups: e.g., apprentice pay relative to unskilled pay. Relative pay is used instead of absolute pay because of the absence of identifying exogenous variation in the distribution of employers and individuals across local labour markets. It is therefore assumed that unmeasured attributes of localities, which have bedevilled cross-locality empirical research, exert proportionally identical effects on absolute pay in the three categories, and therefore cancel out when relative pay is analysed.

Local labour markets are defined as delimited by occupation-sector boundaries (e.g., retailing sales staff) and by a 30-minute car-based travel-to-work time, centred upon the 67 largest Swiss towns and cities. Pay data are taken from the 2004 survey of training costs.

The results (Table 2.1) are consistent with a key assumption in second-generation human capital theory, viz. that pay is set competitively in markets for unskilled

Table 2.1 Fewness of employers and apprentice pay, Switzerland, 2004

	(1)	*(2)*	*(3)*
	Relative pay		
	Skilled/unskilled	*Apprentice/unskilled*	*Apprentice/skilled*
No. of establishments in sector and locality	0.220*	0.040*	0.000
	(0.050)	(0.010)	(0.001)
Hours of training per apprentice	–0.370	–0.080*	–0.010
	(0.190)	(0.030)	(0.030)
R^2	0.27	0.63	0.54

Source: Muehlemann, Ryan and Wolter (2013: Table 4)

Notes: Ordinary least-squares regressions with controls for plant size, apprentice output, prior school grades, training intensity, and sector and occupation group. Standard errors are in parentheses.

*Significant difference from zero ($p < 0.05$).
$n = 2,243$ establishments

labour but by monopsonistic competition in markets for skilled labour: the pay of skilled relative to unskilled employees is significantly higher in local markets with more employers in the relevant occupation-sector category. Monopsony power is found therefore to promote pay compression between skilled and unskilled employees.

As noted above, the other standard assumption in second-generation human capital theory is that training markets are also perfectly competitive, in which case fewness of employers is predicted to have a similarly depressing effect on relative pay for apprentices as for skilled workers. The results show, however, that the pay of apprentices relative to unskilled employees is also significantly higher in local markets with more employers. The regression coefficient for apprentices is indeed absolutely smaller than for skilled workers, but apprentice pay is much lower than skilled pay and the proportional effect is consequently similar for both groups. This suggests an effect of monopsony power in training markets similar to that in skilled labour markets. Monopsony power does not promote pay compression between skilled employees and apprentices (Table 2.1, col. 2).

The estimated effect of monopsony power on apprentice pay is moderately large: a doubling of the number of the number of local employers is associated with an 11.5 per cent increase in relative apprentice pay. Moreover, these results probably capture only part of the effects of monopsony power, as fewness of employers does not capture any further effects from information asymmetries.

Confidence in the validity of the results is increased by two ancillary results. First, concern that the fewness effect on apprentice pay might be generated by an underlying tendency of firms in training markets with fewer employers to offer more training is addressed by including hours of training in the apprentice pay regressions. It proves significant but does not affect the estimate of the fewness effect. Second, there is the association between pay and turnover. In a monopsonistic labour market, low pay and low turnover are the predicted joint outcomes of fewness; in a competitive market, low pay should be associated with high turnover. Regression analysis shows fewness to have a similar negative association with turnover among apprentices and among skilled employees: a one standard deviation increase in the number of local employers raises the apprentice non-completion rate by 35 per cent (over 2–4 years of training) and the annual skilled turnover rate by 13 per cent (Muehlemann, Ryan and Wolter 2013: Table 5).

Cross-national differences in the pay of metalworking craft apprentices

The pay of metalworking craft apprentices is lower in Switzerland, relative to that of skilled employees, than in either Germany or the UK (Table 2.2, row 1). The same national ranking applies to apprenticeship generally, but metalworking craft apprenticeship is of particular interest because of the unusual similarity of training standards in the UK and the other two countries, which means that apprentice pay, not training quality, is expected to bear the burden of adjusting supply to demand in training markets. The volume of apprentice training in metalworking is, however, less than half as large in the UK as in the other two countries (Ryan *et al.* 2011: Table 8).[6]

These cross-national differences in apprentice pay were subjected to qualitative comparative analysis. Twelve national attributes potentially influence trainee pay, mostly by affecting the supply of young people to training. The first column of Table 2.2 indicates the expected direction of an attribute's effect on apprentice pay. The three countries are ranked on each attribute in columns 2–4, using data taken from both published sources and fieldwork (Ryan *et al.* 2011, 2013).

The list starts with four institutional attributes, to do with employer organisation, employee representation and collective bargaining. Employers' associations are widely viewed in Switzerland as discouraging pay-based competition for apprentices; and the coverage of trade unions and collective bargaining is low in Switzerland, compared to Germany in particular. These four factors therefore indicate potentially stronger monopsonistic influences on apprentice pay in Switzerland than in Germany.

The next three factors potentially affect the supply of young people to training, including the availability of unskilled work as an alternative to training, and the economic return to training. For all three attributes, the ratings point to lower apprentice pay in Switzerland than in the other two countries. The country has large numbers of suitably qualified youth, limited markets for unskilled youth labour, and high economic returns to apprenticeship training, in terms of pay and employment prospects.

The next three attributes concern the national school system, including the availability and cost of full-time education as an alternative to apprenticeship, and the scope for educational progression after apprenticeship. Switzerland stands out again in all three dimensions for attributes that promote a larger supply of youth to training markets, and thereby lower apprentice pay.

The final two institutional attributes also potentially affect apprentice pay: whether public training subsidies are paid primarily to employers or to vocational

Table 2.2 Pay of craft apprentices and comparative ratings of its potential determinants, metalworking industry, Switzerland, Germany and the UK

	Predicted effect on apprentice pay	*Switzerland*	*Germany*	*UK*
Apprentice pay (%)[a]		14.1	29.2	40.9
Employers' association coverage	–	High	Medium	Low
Coordination of pay-setting by employers' association(s)	–	Yes	Yes	No
Collective bargaining coverage	+	Low	High	Low
Priority of higher apprentice pay as trade union goal	+	Low	Medium	Low
Availability of qualified and interested youth	–	High	High	Low
Extent of markets for unskilled youth labour	+	Low	Low	Medium
Economic return to individuals for taking training	+	High	Medium	Low
Rationing of access to full-time schooling	–	High	Medium	Low
Mean age of entry to training	+	Low	High	High
Options for continuing formal education after completion	–	High	Low	Low
Payment of public subsidies to employers v. to colleges	+	Low	Low	High
Differentiation of training and employment contracts	–	Medium	Medium	Low

Sources: Ryan *et al*. (2011: Table 23; 2013: Table 2).

Notes: All ratings are relative to the other two countries

[a] Average pay of apprentices relative to average pay of craftworkers (%) *circa* 2004–7. Pay is base wage rates; for apprentices, apprentice allowances (excluding social security contributions, thirteenth-month pay and other benefits and bonuses) in Germany and Switzerland, and weekly earnings (excluding overtime and bonus pay) in the UK. For skilled employees, earnings also exclude overtime pay and other benefits. The average pay of apprentices is measured as a percentage of that of skilled (qualified or experienced) employees in the same occupation, adjusted for differences in hours worked. Pay data are for 2004, 2007 and 2005, respectively. Occupational categories: *Polymechaniker*, *Elektroniker* (CH); *Mechatroniker*, *Industriemechaniker*, *Elektroniker*, *Betriebstechniker* (DE); Engineering Manufacturing, Level 3 Frameworks (UK).

colleges, and the legal differentiation of apprenticeship contracts from employment contracts. These attributes also promote low apprentice pay in Switzerland, particularly compared to the UK – and in that comparison differences in monopsony power are in any case prospectively small.

It is not possible to determine from three observations on 12 variables the contribution of the four factors of interest here, those related to monopsony power. What can be said, comparing Switzerland to Germany in particular, is that inter-country differences in those four factors are all consistent with the difference in apprentice pay. Swiss employers' associations are more broadly organised and no less active in the setting of apprentice pay than are their German counterparts; the constraints imposed by trade unionism, collective bargaining and works councils are stronger in Germany.[7] A substantial explanatory role for monopsony power is suggested also by the fact that Swiss–German differences in the educational structure variables are small, unlike Swiss–British ones.

The implication of these two studies is not that monopsony power in training markets is confined to Switzerland, but that it is probably stronger and easier to detect there than in other national apprenticeship systems. Monopsony power appears to contribute to both the overall level and the geographical dispersion of apprentice pay in Switzerland.

Training-related employer surplus

The next source of evidence of monopsony power in training markets involves surplus generated by apprentices for employers during training, to which monopsony power potentially contributes.[8] Evidence is taken from surveys of employers' training costs in Germany and Switzerland, all of which involve large random samples of employers who train apprentices. The costs in question are those borne by employers for the training of their apprentices during the training period stipulated for the occupation in question. Net costs are defined as the difference between gross costs (i.e., the sum of payroll costs for apprentices and their instructors, materials costs and facilities costs) and the value of apprentices' output. When the pay of apprentices is less than their net marginal product (i.e., value of output minus direct cost of training), the employers' net cost is positive and the employer invests in the apprentice. If, however, apprentice pay exceeds net marginal product, net cost is negative and then, instead of investing in training, the employer derives surplus from providing it. The incidence and size of training-related surplus is the focus here.

Table 2.3 shows the estimated average cost to the employer of training an apprentice in the six national cost surveys conducted in the two countries since the year 2000. The German surveys have all found the net cost of the typical apprenticeship to the employer to be positive, the Swiss ones negative. In both countries, substantial numbers of apprenticeships create surplus during training (i.e., negative net cost to the employer): a large minority of apprentices in Germany, a plurality in Switzerland. The share has risen in Switzerland from 60 per cent in 2000 to 71 per cent in 2009, but fallen moderately in Germany, from 33 per cent in 2000 to 28 per cent in 2012.

Breakdowns of the 2007 German results show substantial numbers of apprentices generating surplus for their employers in all categories of sector, plant size and occupation, although the share is lower than average in large plants, public services, and technically more advanced occupations (Table 2.4). As some of these apprentices generated zero or only trivial surplus, a higher threshold can be set, to distinguish substantial surpluses from small ones. If a threshold of €2,000 (i.e., net cost absolutely less than *minus* €2,000) per year of training is adopted, a

Table 2.3 Survey estimates of the cost of apprenticeship training to employers in Germany and Switzerland (average net cost in thousands of euros, current prices, per apprentice per year of training)

		Sample size	*Average net cost*	*Share of apprentices with surplus*
		'000	*€'000*	
Germany	2000	2.52	2.4[a]	33[a]
	2007	2.99	3.6	35
	2012	3.03	5.4	28
Switzerland	2000	2.35	–2.90	60
	2004	2.41	–1.70	63
	2009	2.43	–3.20	71

Note: Net cost is payroll cost for apprentices minus estimated value of apprentice output during the training period; it includes any chargeable training conducted by other bodies (fees paid)

[a] Estimated on the *Teilkost* basis, which assigns zero cost to staff and facilities used jointly with other activities; the other cost estimates include output lost as a result of using such resources for apprentice training (Ryan 2015).

Sources: for Germany, Schönfeld *et al*. (2010) and Ryan (2015: Table 1); for Switzerland, Strupler and Wolter (2012) and Muehlemann and Wolter (2014: Table 1).

substantial incidence remains: one quarter of apprentices overall, and more than one half in such large *Handwerk* (artisan/craft) occupations as hairdresser, baker, and grocery store sales assistant (Table 2.4, cols 3, 4).

The statistical worth of these estimates might be questioned in terms of reliability and validity, but they stand up well on both counts. Large sample sizes mean high reliability, apart from the smaller occupational categories. Validity has proved more controversial, with allegations of systematic bias in the estimates, and in particular the undervaluation of apprentice output. Detailed analysis suggests, however, that while the method of estimating apprentice output does tend to underestimate the cyclical variability of net costs, it does not cause any readily signed direction of bias in estimates of structural (cyclically neutral) training costs and surpluses (Ryan 2015). The finding of interest here, viz. that surplus is generated by a large minority of German apprentices and a majority of Swiss ones, can therefore be taken to be statistically sound.

Given that, how is training-related surplus generated, and does monopsony power contribute to it? A role for monopsony power is suggested if the viability of surplus in perfect competition is considered. Assuming temporarily that all employers possess full information on training costs and that all use an identical linear production function in work-based training, then, if surpluses are generated by training, the supply of training should increase, as profit-seeking employers who already train expand their programmes, and employers who do not train start doing so. Increased competition for trainees would then raise apprentice pay and/or increase the quality (and therefore the cost) of training, until in equilibrium all training-related surplus has been destroyed.[9]

Table 2.4 Estimates of cost to employers of apprentice training in Germany, 2007 (average net cost per apprentice per year of training)

		(1) *Share of all apprentices*	*(2)* *Average net cost*	*(3)* *Share of apprentices in category (%) with net cost*	*(4)*
		(%)	*(€'000)*	*≤ 0*	*< –€2,000*
Sector	Public services	7.9	7.23	16.3	11.1
	Industry and commerce	56.0	4.61	32.2	24.1
	Craft trades	30.6	2.51	36.6	25.4
	Agriculture	2.7	0.96	42.2	31.6
	Liberal professions	2.8	0.27	47.3	30.6
Plant size (employment)	1–9	20.7	2.47	35.1	24.0
	10–49	24.6	2.97	36.1	26.0
	50–499	35.8	2.80	39.5	28.0
	500+	18.9	7.17	22.7	18.2
Occupation-cum-sector (selected)	Electromechanical craft	2.1	15.53	10.7	9.0
	Engineering craft	5.0	10.46	14.8	11.6
	Optician	0.5	8.39	6.2	3.7
	Bricklayer	1.0	4.47	25.5	21.8
	Bank administrator	3.2	3.69	35.0	25.1
	Retailing administrator	7.4	2.57	37.5	25.3
	Warehousing logistics	1.7	0.73	42.3	34.0
	Hairdresser	3.6	–1.18	47.1	36.6
	Baker	1.5	–2.13	70.9	52.7
	Hotel administrator	3.1	–3.22	62.5	58.9
	Grocery store assistant	2.9	–6.82	68.4	56.8
All		100.0	3.60	34.6	24.8
Standard dev.			0.09		

Sources: Schönfeld *et al*. (2010: Tables 4, 10, 14 and Figures 11, 12); unpublished results provided by the Bundesinstitut für Berufsbildung. See also Ryan (2015).

The potential sources of surplus acquisition can be identified by relaxing these assumptions. If monopsony power replaces perfect competition, the resulting gap between net marginal product and pay during training creates marginal surplus for the employer, in training markets as in labour markets. Intra-marginal surplus is also present, in so far as the marginal product of apprentices falls with the volume of training. If the other assumptions apply, monopsony power is the key to surplus acquisition.

The other three factors can, however, be expected also to contribute to surplus acquisition. The primary alternative explanation concerns the existence of training technologies other than linear and identical ones. To the extent that work-based learning involves (i) inter-firm differences in costs (for a given volume of training) and (ii) decreasing returns to scale – i.e., marginal training cost rises with training volume – (intra-marginal) surplus will exist even in competitive equilibrium, i.e., in the absence of monopsony power.

Surplus based on cost differences between employers represents then Ricardian rent: the return to a favourable location or the use of superior and scarce training methods. Its importance is, however, open to doubt. Work-based training is unlikely to resemble agriculture or natural resources, in terms of any scarcity of locations and methods characterised by high fertility or low extraction costs. Best training techniques are extensively disseminated by training specialists, employers' associations and external training agencies. Similarly, as training often involves fixed costs for facilities and administration, increasing returns to scale, as overheads are spread over more trainees, might be expected, not decreasing ones.

Econometric evidence suggests that inter-firm cost differences do contribute to surplus acquisition. Estimates of the average cost difference per apprentice between Swiss employers that do and do not train amounted to fully $39,000 in one study (Wolter *et al*. 2006). Survey-based evidence suggests, however, *increasing* returns to scale in training (in Switzerland), but decreasing returns to scale in apprentice recruitment (in Germany), which leaves open the direction of returns to scale in combined recruitment and training costs (Blatter *et al*. 2012; Muehlemann, Pfeifer and Wenzelmann 2013).

The informativeness of this econometric evidence is weakened by the restrictiveness of the assumptions on which the econometric identification of both firm-specificity of costs and returns to scale depends (Ryan 2015). The plausibility of significant roles for inter-firm cost differences and decreasing returns to scale rests perhaps more on less formal evidence. Inter-firm cost differences are suggested by the fact that non-training firms frequently state that they would find it difficult to find work assignments to give apprentices that both meet externally mandated training requirements and yield useful output (Strupler and Wolter 2012: 24–6). Similarly, if the trainability of the firm's applicants for training is highly differentiated, the cost of identifying and training young people can be expected to rise with the scale of training, as less trainable applicants are taken on (Muehlemann, Braendli and Wolter 2013). Both factors are particularly likely to characterise small employers.

It therefore appears plausible to view training-related surplus as deriving at least in part from the technological attributes of training. It is not, however, plausible to see surplus as deriving entirely from technological attributes, without any contribution from monopsony power. Four considerations support such an assessment.

The first concerns complementarities between the two explanations. When inter-firm cost differences and decreasing returns to scale are both present, the entry of new employers and the expansion of existing ones, respectively, are both curbed. Such conditions can be expected to buttress the monopsony power of training firms in any training market with few employers – as many will be when mobility costs are high for young people, and training markets are correspondingly localised.

Second, patterns of surplus acquisition suggest the presence of monopsony power. Two attributes stand out. There is first the considerable heterogeneity visible within occupation-sector categories (Table 2.4). In those categories in which the average employer incurs positive net cost, many employers earn substantial surplus; similarly, in those in which the average employer earns a substantial surplus, many employers incur positive net cost. The source of these large firm-level differences remains unclear. What can be noted is that such heterogeneity is consistent with standard models of monopsonistic competition in segmented labour markets, but not with competitive equilibrium (Manning 2003).

A second suggestive feature is the large proportion of apprentices who generate surplus as apprentice grocery assistants, hotel administrators, bakers, and hairdressers. That attribute is associated with low apprentice pay and low collective bargaining coverage in those occupations (Bundesinstitut für Berufsbildung 2015). Low pay might of course reflect low ability, prior achievement, or motivation among those apprentices, but low collective bargaining coverage suggests a role for monopsony power.

The third reason for doubting any explanation of training surplus in purely technological terms concerns the employer attributes and practices that are associated statistically with surplus acquisition. A considerable applied economics literature analyses training surplus as evidence of the employer's motive for providing training. Positive net cost is interpreted as evidence of investment-oriented training, in which the motive is to secure the firm's future supply of skilled labour: rather than earning surplus during training, the employer incurs positive net cost. Negative net cost (i.e., positive surplus) is interpreted as evidence of production-oriented training, in which the employer's goal is to minimise current production cost, using the relatively cheap labour of apprentices, so that surplus accrues during training.[10]

The distinction between the two motives is reinforced by other attributes, notably the retention of apprentices after training. An investment-oriented employer is expected to retain most or all apprentices, as future sources of skill supply; a production-oriented one, to retain few or none, in order to replace what has become high-priced qualified labour with low-priced apprentice labour. Statistical evidence shows that retention after training is not only highly dispersed across employers, but also associated with training surplus: employers that earn surplus have lower retention rates (Wolter and Schweri 2002; Mohrenweiser and Backes-Gellner 2010). The same employers also show both a higher volume of training, in terms of the ratio of apprentices to qualified employees, and a lower quality of training, in terms of the complexity and learning content of work assignments during training – as would be expected when the employer has a production-oriented rather than an investment-oriented motive for training (Neubäumer 1997; Smits, 2005, 2006; Wenzelmann 2012).

These associations between surplus acquisition, on the one hand, and training quantity, training quality, and apprentice retention, on the other, suggest an underlying role for monopsony power in surplus generation. Inter-firm differences in training costs and decreasing returns to scale cannot by themselves explain those associations: why would an employer offer an above average volume of below average quality training and lay off most or all of its apprentices after training simply because it had low training costs or faced decreasing returns to scale in training?

The fourth source of evidence on monopsony power in surplus generation is training vacancies. Great monopsony power should lead to high vacancy rates: the employer would recruit more apprentices were more applicants available at the pay level it offers. Imbalances between supply and demand certainly feature in training markets, associated with the cyclicality of both demand and supply (Muehlemann *et al*. 2009; Brunello 2009). Setting aside cyclical effects, however, the occupations in which surplus generation is widespread show an above average incidence of unfilled vacancies.

The ratio of unfilled to offered training places is in Germany highest, at one-fifth or more, in five occupations in which training surplus is widespread: restaurant specialist, butcher, plumber, grocery store sales staff and baker (2012 data; Bundesministerium für Bildung und Forschung 2014: Fig. 15). The pattern suggests monopsony power in those occupations, in so far as apprentice pay does not rise to remove excess demand for trainees.[11]

At the same time, the greater difficulty for public policy in the aggregate is posed not by excess demand but by excess supply (i.e., an inadequate supply of training places). The result in Germany has been a large ‘transition system’, catering mostly to young people who cannot find an apprenticeship (Thelen and Busemeyer 2012). Monopsony power cannot therefore be seen as dominating German training markets in general.

In sum, the evidence remains too scanty, both on monopsony power and on training technologies, to determine their relative importance in generating training-related surplus. Moreover, some contribution can be expected from the other two factors suggested by relaxing the assumption of perfect competition: employer ignorance and disequilibrium. Some non-training employers may simply be unaware of the profits to be made from training apprentices. Surpluses may be subject to competitive erosion at employer level but be continuously regenerated by disequilibrating shocks. The evidence on these two factors is also limited, but it does suggest only that their contribution is only secondary (Ryan 2015).

The part played by monopsony power in surplus acquisition is therefore difficult to determine. At the same time, it appears plausible to view surplus acquisition as deriving to some extent, and potentially to a considerable extent, from monopsony power in training markets.

Collective organisation and action by apprentices

The final source of evidence of monopsony power in training markets is also indirect: the episodic and neglected phenomenon of the apprentice strike. In the twentieth-century UK, strike movements involving metalworking apprentices

Table 2.5 Attributes of strike movements by apprentices in UK metalworking industry, 1910–70

	Duration	*Number of strikers*	*Working days lost*		*Ensuing change in age-wage scale rates*[a]
	Days (calendar)	*'000*	*Total ('000)*	*Per striker*	*(% points, 18 year olds)*
1912	70	14.6	n.a.	n.a.	n.a.
1921	33	6.5	n.a.	n.a.	n.a.
1937	94	32.5	406	12	1.8[b]
1939	16	2.2	19	9	1.7
1941	62	25.1	220	9	8.3
1944[c]	16	17.0	150	9	n.a.
1952	24	16.4	194	12	6.4
1960	27	36.9	347	9	5.5
1964	23	6.0	26	4	3.6
Mean[d]	38	17.5	187	10	4.6

Sources: Ryan (2004: Table 1, Figure 3).

Notes:
n.a.: not available or not applicable
[a] Increase in the aftermath of the dispute in the age-wage scale rate (ratio of basic weekly time rate of pay of 18-year-old apprentice fitters relative to that of craft fitters) in federated engineering firms.
[b] Difference between the first collectively bargained scale rates and the preceding district rate recommended by local engineering employers' association in the five largest associations (unweighted average).
[c] Apprentices struck against the prospect of the conscription of metalworking apprentices into coalmining; no pay-related content.
[d] Years with data in rows above.

were a recurrent feature of the industrial landscape. The period 1910–70 saw nine movements large enough to be classed in official statistics as 'principal disputes'. All ranked among the country's ten largest industrial disputes of the year. They involved on average 18,000 participants, almost all of them male craft apprentices, the loss of ten working days per participant, and a cumulative duration of 38 calendar days. All drew in large numbers of employers in both engineering and shipbuilding, primarily in the industrial districts of central Scotland and northwest England (Table 2.5). A range of smaller disputes also occurred at district and firm levels.

All of the apprentice strikes were unofficial, at least at the outset. They were conducted by *ad hoc* committees of apprentices formed for that purpose, with only limited organisational continuity between strikes. Trade union officials supported some strikes, mostly at district level, but opposed others. National union officials typically used the strikes to recruit young workers and to win or extend recognition by employers of their right to bargain on behalf of 'junior male workers'. The principal demand, in all but one dispute, particularly after collective bargaining coverage was established in 1937, was higher pay for young males, relative to other grades of labour, as determined by age-wage scales (e.g., apprentices to be paid 50 per cent of the craft wage rate at age 18; Ryan 1999, 2004, 2010).

Although such movements might be seen as a historical curiosity, their implications for monopsony power emerge when the conditions for their success are considered. In economic theories of bargaining, the power of a strike threat hinges on the degree to which the potential strikers can credibly threaten damage to the employer, compared the damage that a strike would do to the strikers themselves. When investment-oriented training is present, and apprentice pay exceeds the value of net output during training, such a strike threat would have little or no credibility. The employer's profits would be increased in the short term, as the loss of output caused by a strike would be smaller than the savings in payroll costs. Under production-oriented training, with surplus generation by apprentices, by contrast, the opposite applies: the strike threat is credible, as a dispute would reduce short-term profits by cutting output by more than payroll costs. Longer-term effects and political considerations may also enter into the calculation, but the immediate effects on payrolls and output are taken to dominate the parties' decisions.

It was argued above that the viability of production-oriented training depends on monopsony power. A simple test for the presence of monopsony power in metalworking training markets at the time is therefore whether the strike movements achieved the apprentices' objectives: if they did, even in part, the strikes can be taken to have possessed economic leverage, which in turn suggests the presence of production-oriented training and monopsony power.[12]

The strike record is one of substantial, if incomplete, success. Apprentices' pay demands were never conceded in full, but the eight movements conducted in pursuit of higher relative pay all resulted in increases in apprentice scale rates, including some large ones. Achieving those increases required in all cases the involvement of national union officials, as the employers' associations refused to negotiate with apprentice representatives. The contribution of the apprentices' activism can however be inferred from the stasis that characterised sector-wide pay structures in most other years. Trade unions frequently pressed the employers to concede higher rates for apprentices, but, in the absence of a recent apprentice strike movement, they invariably came away from negotiations empty-handed.

Other attributes of the relevant training market also point to a high incidence of monopsony power in the sector in that era. First, overt collusion to restrict competition for apprentices on pay was selectively visible. Until the apprentice strikers had wrung from the employers' associations during 1937–41 their right to coverage by collective bargaining, local employers' associations in some districts, notably the Clyde Shipbuilders Association in Glasgow, operated their own age-wage schedules – which were set up as maximum rates, not the minimum ones to which they were converted under collective bargaining as of 1937 (Ryan 2004). Second, not only were high proportions of apprentices, particularly in shipbuilding, paid under piecework, which encouraged task specialisation, they received piece prices substantially below those paid to qualified adults when doing the same work. Given the limited quality of the training most apprentices received – with technical education confined to a minority, and conducted mostly on apprentices' own time, after work – the differential in piece prices can hardly be attributed to employers' direct training costs, but rather serves as evidence of monopsony power in the relevant training market.

Indeed, British shipbuilding may be viewed as having through the 1930s combined collective bargaining (not monopsony power) in occupational labour markets, with monopsony power (not perfect competition) in training markets – a combination of market structures that reverses the pairing of assumptions that characterises much economic theory nowadays (Jefferys 1945: 210; Ryan 1999; Reid 2010: 137).

As there was no external collective regulation of work-based training in the era of the apprentice strikes, the scope for employers to exercise monopsony power over apprentices was undoubtedly greater then than it is nowadays in Switzerland and Germany, where minimum training standards are enforced by public authority.[13]

Conclusions

The economic analysis of work-based training requires elaboration, to incorporate the possibility of monopsony power in training markets as well as in skilled labour markets. The conventional assumption of 'free entry' by agents in training markets lacks the general applicability that most economists still accord to it.

The factors that potentially give many employers monopsony power over trainees include both traditional and 'modern' components. The traditional factors are fewness of employers and collusion by employers. They are made relevant by the localisation of labour markets caused by mobility costs, partly for employers, but primarily for young people seeking apprenticeship training. The monopsony power caused by these factors is expected to vary considerably – both across occupations and localities a within a country, as is apparent in evidence for Swiss apprenticeship, and across countries, in terms of such institutional attributes of national training systems as the coverage of employers' associations and collective bargaining, as is suggested by comparing apprentice pay in Switzerland to that in Germany and the UK, and by the broader ambit of training-related surplus in Switzerland than in Germany.

The 'modern' causes of monopsony power, which involve asymmetric information as well as mobility-based frictions, are also potentially strong in training markets, reflecting the age and inexperience of most potential trainees, the difficulty of observing work-based training from the outside (by other employers as well as by potential trainees), the difficulty for the trainee of assessing the quality of training during training, and the ties that bind apprentices with increasing strength to the employer after a training contract has been signed. Although direct evidence of 'modern' monopsony power is elusive, it may be taken to be both structural and widespread.

The relationship between monopsony power and firm size is of some interest. Small firms might be expected to have less monopsony power than larger ones, in that they compete with more employers in the relevant training market.

Moreover, the technological causes of surplus seem to be particularly marked among small firms, given high variation in production methods and therefore in options for finding work tasks for apprentices that are productive as well as instructive. On the other hand, small employers, in traditional *Handwerk* occupations at least, tend to have last choice in recruiting young people for training. To the extent that such firms recruit less able youngsters with lower prior educational attainment and lower motivation, their hold over their apprentices may be stronger, not weaker, than that of the larger employer.

Both types of monopsony power can be counteracted by the external regulation of training standards, which permits employers to commit credibly to the content of their training programmes. External regulation cannot, however, be expected to cancel monopsony power altogether, as external training standards specify only the minimum acceptable content of training and asymmetric information about workplace training hampers external regulators too.

When external regulation is absent or ineffective, as in a wide range of historical and contemporary instances that have gone under the rubric ‘apprenticeship’, employers enjoy more scope to set training content. Monopsony power then promotes ‘low pay, low quality, high volume’ training (Marsden and Ryan 1991b). Indirect evidence of such effects has been presented here, in the effects of collective action by apprentices in British metalworking during the last century. In a wider perspective, whether historical or cross-national, monopsony therefore looms larger in training markets than in either Germany or Switzerland nowadays.

Were the role of monopsony power in training markets to be taken on board, that might improve our understanding of the effects of wage decompression (relative to a purely competitive pay structure). Greater monopsony power in a training market than in the related skilled labour market might explain why particular employers pursue production-oriented rather than investment-oriented training, implying higher activity but lower quality in their training programmes.

Another potential benefit of incorporating monopsony power into the economics of training might be some convergence between economic theory and social criticism in the field of youth employment and training. The term ‘exploitation’ is central to both the economic theory of monopsony and socio-political criticisms of the functioning of youth labour markets, which have become particularly prominent during times of economic distress, including in Britain the 1930s, 1980s and 2010s. The connotations of ‘exploitation’ differ in the two traditions, but they do so in potentially informative ways. It is time that the two approaches recognised each other’s existence and interacted, to the potential enrichment of each.

Acknowledgements

I would like to thank the editors, participants at the Salerno conference, Giorgio Brunello, Philipp Gonon, Samuel Muehlemann, Matthias Pilz, Felix Wenzelmann, Stefan Wolter and Thomas Zwick for comments and suggestions, and BIBB (Bonn) for unpublished data.

Notes

1 Becker recognised two causes of market failure, both of which change the prediction: in labour markets, firm-specificity of skill; in capital markets, inalienability of human capital. Only the former induces the employer to invest in training.
2 The inappropriateness of assuming that apprentice pay is set by market forces alone is recognised also by institutional economists – as is that of uniformity in the bargaining objectives and effects of trade unions (Ryan 1987, 1994, 1999; Marsden and Ryan 1991a; Bassanini *et al*. 2007; Ryan *et al*. 2013).
3 The possibility of monopsony power in training markets has been discussed by Manning (2003: 306), who sees it as encouraging learners to prefer full-time education to work-based learning. Such diversionary effects are, however, likely to be weak if full-time schooling is expensive or unavailable, or viewed as unpalatable by young people.
4 Alternatively, the price elasticity of demand for training by young people is finite at firm level.
5 When only few firms are involved, their interdependence makes the market outcome sensitive to detailed assumptions about the firm's behaviour, as under oligopoly in product markets.
6 An unpublished revised estimate by the author of the proportional volume of apprentice craft training in British metalworking, as indicated by the ratio of apprentices to employees, shows a ratio of 2.4 per cent for 2007, compared to 4.9 per cent for Switzerland and 5.8 per cent for Germany.
7 The possibility that employer organisations contribute to the low pay of Swiss apprentices was confirmed by interviews with officials in federal government and an employers' association. Both saw employers' associations as unobtrusively discouraging pay-based competition for apprentices (Ryan *et al*. 2011).
8 A fuller analysis is provided in Ryan (2015).
9 The potential for new entry to eliminate surpluses in a competitive training market was pointed out by Muehlemann *et al*. (2010: 801–2).
10 For apprentice training in the UK, Lindley (1975) emphasised the production motive, Merrilees (1983) and Stevens (1994b) the investment motive. See also Backes-Gellner (1995), Büchel and Neubäumer (2001), Smits (2005), Zwick (2007) and Mohrenweiser and Zwick (2009).
11 Manning (2003: Chapter 10) argues that the willingness of employers to take on more workers in monopsonistic labour markets is underestimated by announced vacancies, as there may be significant costs to posting a vacancy. This view is less than convincing for German training markets, in which the cost to the employer of informing the public training authority of openings for additional apprentices is prospectively low.
12 Although pay increases for apprentices might have occurred anyway, because of excess demand for trainees during postwar prosperity, an important role for the strikes is suggested by the resistance that employers' associations mounted in all cases to the demand for increases in apprentice scale rates.
13 The same had not applied even in Germany and Switzerland through the early 1970s, before the effective external regulation of the workplace component had fully developed, particularly for small establishments. Training programmes that combined low pay and low quality were still numerous, and public concern was prompted there too by collective action undertaken by apprentices (e.g. Weiler and Freitag 1971; Templin 2011).

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3 Overeducation

A disease of the school-to-work transition system

Floro Ernesto Caroleo and Francesco Pastore

Introduction

The mismatch between the education level of workers and that required by the jobs available in the labour market represents one of the most debated dimensions of the education and skills mismatch. Both the horizontal and vertical dimensions of the mismatch are expected to increase in the near future. First, many observers believe that the horizontal mismatch, which happens when the *level* of schooling is appropriate but the *type* of schooling is not (Sloane 2003), is bound to increase due to two main factors: first, the increasing complexity of the industrial structure, which causes a mismatch between the composition of labour demand and supply by types of education and skills; and second, and the insufficient coordination of education institutions with labour market evolutions (see, among others, Robst 2007; Nordin *et al*. 2010).

Moreover, the increasing education level of the youngest generation causes growing concern that the mismatch will take the form of (vertical) overeducation, which happens when the number of years of schooling required for the job is lower than the number of years of schooling completed (so-called excess schooling), and overskilling, which happens when the skills required to do the job are lower than the skills individuals have.

Overeducation imposes a penalty on individuals in terms of earnings and employment opportunities and a waste of resources on society at large in terms of state investment in education that does not bear fruit (Groot 1996, Büchel *et al*. 2003, McGuinness 2006).

In this chapter we discuss the factors determining overeducation by reviewing the main empirical and theoretical literature. A great deal of research stresses such supply-side aspects as the labour market segmentation, individual characteristics, the efficiency/inefficiency of the institutions governing the school-to-work transition as well as the quality of the education system. Fewer studies highlight the qualitative and quantitative demand factors and, in particular, the effect on the evolution of labour demand due to technological change and globalization.

Comparative evidence suggests that Italy, like other Mediterranean countries, has a higher than average share of overeducated workers. On the other hand, when it comes to overskilling, Italy tends to the European average (McGuinness and Sloane 2010; Barone and Ortiz 2011).

In the second part of this chapter we deal with the specific case of Italy. We review the empirical literature with a special focus on the estimates of the wage penalty associated with overeducation.

The outline of this chapter is as follows. We begin by discussing the role of the evolution of the aggregate supply of and demand for skills over time and across countries and regions. We then provide a summary of the theoretical explanations for the emergence of the skills and education mismatch. After summarizing the relevant empirical literature, we focus on the literature on Italy. Then we discuss some recent estimates of the wage penalty associated with overeducation as based on the AlmaLaurea database. The concluding section also discusses possible policy suggestions to reduce the impact of overeducation.

The demand for and supply of skills

Most research focuses on the supply side and on individual factors, most probably because overeducation is typically studied based on individual-level data and, in particular, on data drawn from labour force surveys. Fewer recent studies attempt to bring the demand side into the picture, which is clearly an important component of theoretical explanations since any mismatch in the level of educational qualifications and skills must be a matter of relative demand and supply of skills. Three approaches have been followed: cross-country analysis; comparison of local labour markets; and employer heterogeneity.

Cross-country analyses attempt to capture the role of the demand for skills by looking at the different characteristics of the production structure of different countries. The early literature in the field focused on why the skills premium has been escalating in the USA, but not in Europe. Manacorda and Petrongolo (2000) suggest that the explanation is to be found in the different evolution of industrial development in Europe, which has been lagging behind in terms of, for instance, the information and communication technologies, especially the southern European countries.

In their cross-country analysis of the determinants of the skills mismatch, Verhaest and van der Velden (2010) find that the cross-country variation in overeducation and its persistence are related, *inter alia*, to differences in the structural imbalance between the overall demand for and supply of skilled workers. Ghignoni and Verashchagina (2014) also find evidence of demand-side factors in explaining the overeducation phenomenon in a sample of ten EU countries.

Croce and Ghignoni (2012) find that the continuous increase in the supply of skills does not explain the rise in overeducation except in the short run and over slowdowns of the business cycle. They argue that when the business cycle reverts to growth, the increased supply of skills is reabsorbed. This would be in line with Acemoglu's (2002) theory of the endogeneity of technical change. In other words, overeducation would be a short-term phenomenon and a consequence of the time that is necessary for labour demand to adapt to the increased supply of skills. Schivardi and Torrini (2011) provide circumstantial evidence of the role of human capital in favouring industrial restructuring at a firm level and innovative activities.

Galasi (2008) applies the sample selection bias test to assess the role of the human capital model and the Mincerian approach versus the job competition approach to explain overeducation in a number of European countries.[1] He assumes that where ordinary least squares (OLS) produces unbiased estimates, the human capital model would apply to overeducation, which would result from an inefficient investment in education by the individual. Instead, if wages need to be corrected for sample selection bias, then the job competition model would apply, suggesting that the demand for skills is inherently low for the production of skills that the education system generates. He finds that the job competition model holds true for most countries in his sample, which supports a demand-side explanation for overeducation in most European countries.[2]

Another approach has involved comparing local labour markets in the search for the impact on the education and skills mismatch of the industrial structure and organization. In this stream of the literature, Cainarca and Sgobbi (2009) find evidence of a strong impact of an economic structure based on traditional and scarcely innovative manufacturing activities on the probability of experiencing the education mismatch in both forms of undereducation of poorly qualified, but highly experienced workers and overeducation of highly qualified, but inexperienced workers. Other contributions (see, for instance, Leoni 2011) focus on the role of work organization in explaining the mismatch between competences acquired and tasks deployed in the firm.

Theoretical explanations of overeducation

Theories that explain overeducation range between two opposite theoretical constructs: the human capital theory and the job competition model (for in-depth surveys, see Sloane 2003; McGuinnes 2006; Leuven and Oosterbeek 2011). Traditionally, overeducation has been considered an exception to the human capital theory as it is associated with a mismatch and therefore a market disequilibrium. Accordingly, it should be a short-term phenomenon as a sufficient degree of wage flexibility should restore any imbalance between supply and demand in the graduate labour market unless some persistent, often unobserved, low ability/skills problem affects the permanently overeducated. As Leuven and Oosterbeek (2011) note, more recent literature tends to restore the validity of the human capital theory in explaining overeducation.

To clarify this line of reasoning, suppose that, as a matter of fact, overeducation could be conceived as a signal of a lack of the work-related component, rather than a waste of human capital. Recall from Becker (1964) that human capital is not only represented by the level of education but also by generic work experience and the work experience that is specifically acquired by working for a sufficiently long period of time on a particular type of job. Overeducation is therefore a consequence of a lack of skills that could be acquired through work experience, and this is typical of young people, despite their increasing education level. One would thus expect overeducation to be more common where the education system is of a sequential type, namely where the mission of the education system is to generate general education rather than all-round human capital, than for dual education systems (for a more in-depth analysis of the youth experience gap and a classification of school-to-work transition regimes, see Pastore 2015).

The job competition model, introduced by Lester C. Thurow (1979), on the other side, helps us understand the *persistence* of overeducation also among adults. In this case, excess schooling is a consequence of the competition for jobs in the presence of the rigidity of demand for highly educated labour that leads graduates to accumulate education, which is in some cases more than that required to get a job, in order to reach the best position in the queue for the job.

With the assignment theory, Sattinger (1993) attempted to reconcile the two previous theories. Like the job competition model, it assumes that the jobs available in the economy are limited, which implies that remuneration is job-specific and independent of the human capital endowment of the individual; on the other hand, like the human capital theory, it assumes that with their investment in human capital individuals are able to compete for the best job and wages are bound to be influenced by the human capital level of individuals. Overeducation arises because wages will neither be entirely related to acquired schooling and other individual attributes, as in the human capital model, nor to the nature of the job, as in the job competition and job assignment model.

The job search theoretical model assumes instead that unemployment is largely a voluntary choice. People accept a job offer when it brings with it a wage higher than their reservation wages. The most skilled graduates prefer to wait until when they get the best job offer they can. Highly skilled individuals have higher reservation wages and wait for a longer time than the least skilled graduates, who tend to accept the first job offer they get, even if it involves overeducation. Overeducation arises because the least skilled individuals accept the first job offer they can because their reservation wage is low. Albrecht and Vroman (2002), Gautier (2002), Dolado *et al*. (2009) and Carroll and Tani (2013) are examples of this stream of the literature.

Overeducation may result also from career mobility theories (Sicherman and Galor 1990; Büchel and Mertens 2004): wages tend to grow over time together with the work experience accumulated by individuals. It is therefore natural that firms and graduates generate job–worker matches with low earnings in the short run, but good career prospects in the long run.

The empirical literature

While early studies focused on the USA (Freeman 1976), overeducation and skills mismatch patterns have more recently been noted in other economies, including several European countries (for overviews, see Büchel *et al*. 2003;

Rubb 2003; McGuinness 2006; Leuven and Osterbeek 2011) and specifically Italy (AlmaLaurea 2005; Di Pietro and Urwin 2006; Ordine and Rose 2009; Ortiz 2010). These studies have addressed the following issues:

(a) size and cross-country determinants of overeducation;
(b) within-country and educational qualification determinants;
(c) penalties in terms of earnings and employment probabilities;
(d) shortcomings of OLS and corrections for measurement errors, sample selection and endogeneity bias.

Issue (a) is one of the most complex to deal with, due to the lack of comparative data. In addition, whatever the measure of overeducation or overskilling adopted, measurement errors are very common, thus requiring the utmost caution when studying this form of education/skills mismatch (see, among others, Chevalier 2003; Leuven and Oosterbeek 2011).

As seen before, expectations based on theoretical reasoning and early evidence on the skills mismatch across OECD countries (Manacorda and Petrongolo 2000) point to lower overeducation in the EU than in the USA. Nonetheless, supply-side considerations suggest that also in (southern) European countries, overeducation might have become an issue in recent years, due to the dramatic increase in the supply of human capital in a context of sluggish economic growth and innovation rates. The human capital boom has been the consequence also of policy intervention. Continuous reforms of the education system starting from 1999 have been aimed, *inter alia*, at reducing the direct and indirect cost of education, in order to boost educational attainment.

A recent, flourishing stream of literature is attempting to estimate the relative impact of demand- and supply-side variables in cross-country panel data analyses. Demand-side variables and differences in the imbalances between the composition by field of study of the demand for and supply of education have been found to be more important than institutional factors (Davia *et al*. 2010; Verhaest and van der Velden 2010; Croce and Ghignoni 2012).

As to (b), overeducation is typically attributed to similar observed characteristics, such as holding a degree in the arts or social sciences, the fact of studying and working, and the tendency to work before starting to attend a university programme.

Even if the return to education (c) is still positive for the overeducated and higher than that obtained by workers holding only a secondary school diploma (Brynin and Longhi 2009; Franzini and Raitano 2012; Wasmer *et al*. 2005), nonetheless, they invariably incur a wage penalty for being overeducated as compared to their peers employed in positions for which they hold the required diploma. Leuven and Oosterbeek (2011) report a low wage penalty associated to overeducation of less than 10 per cent as compared to the return to required schooling.

Moreover, generally speaking, the wage gap for overskilling is lower than that for overeducation (see, among others, Sloane *et al*. 1999; Wasmer *et al*. 2005).

The greater probability of overrating overskilling as compared to overeducation might explain this. In addition, overeducation is more likely to signal an objective disadvantage at the workplace. Dolton and Silles (2008) find a wage penalty of about 16 per cent for overskilling and 23 per cent for overeducation. McGuinness and Sloane (2010) find an average wage penalty associated with overskilling of about 10 per cent, compared to about 30 per cent in the case of overeducation in a sample of seven EU countries, using the REFLEX dataset.[3]

Issues (c) and (d) appear more and more closely related to each other, since many authors have raised the concern that simple OLS estimates tend to dramatically underestimate the wage penalty associated with overeducation. Three types of possible sources of bias have been highlighted in the literature: endogeneity; sample selection; and measurement errors. While endogeneity tends to generate upward corrections of the wage penalty, and measurement errors tend to generate downward corrections, sample selection bias has a potentially ambiguous effect.

Measurement errors might tend to reduce the wage penalty since individuals often believe themselves to be overeducated (or also overskilled) when they are not. There might thus be a tendency for the wage penalty of the overeducated to be lower on average, since it is computed also on individuals who are not genuinely overeducated. It is important to detect the cases of measurement errors to understand whether and how many individuals are not overeducated. In fact, as the measurement based on statistical overeducation shows, there are also many cases of undereducation. If not adequately accounted for, they might tend to overestimate the wage penalty associated to overeducation, since the baseline group of the non-overeducated might possibly include also the undereducated, whose wage is proven to be lower than average. Chevalier (2003), Mavromaras *et al*. (2010) and Pecoraro (2011) examine ways to measure the wage effect of genuine versus apparent overeducation by looking at the relation between overeducation and job satisfaction.

Endogeneity arises if overeducation is assumed to be related to unobserved characteristics, such as a lower level of skills and motivation of the overeducated. Now, if the overeducated are less motivated than average, the wage penalty is likely to be higher than that typically found. In fact, controlling for unobserved motivation and skills, overeducation should generate a greater wage penalty.

Nicaise (2001) was among the first to notice that ignoring the non-employed might generate a bias on returns to education whose direction is in principle ambiguous. Applying her line of reasoning to the case of overeducation, as represented in Figure 3.1, according to the job competition and job assignment models, sample selection bias arises because of the fact that the education mismatch appears first of all in the form of a higher probability of non-employment and only at a later stage takes the form of a wage penalty. Controlling for the selection bias arising from the presence of non-employment, the wage penalty of those experiencing an education mismatch might be much higher. Conversely, according to the search theoretical model, unemployment is a voluntary choice and the most skilled graduates prefer to wait in non-employment until they get the best job offer they can. Accordingly, sample selection causes an upward bias in OLS estimates.

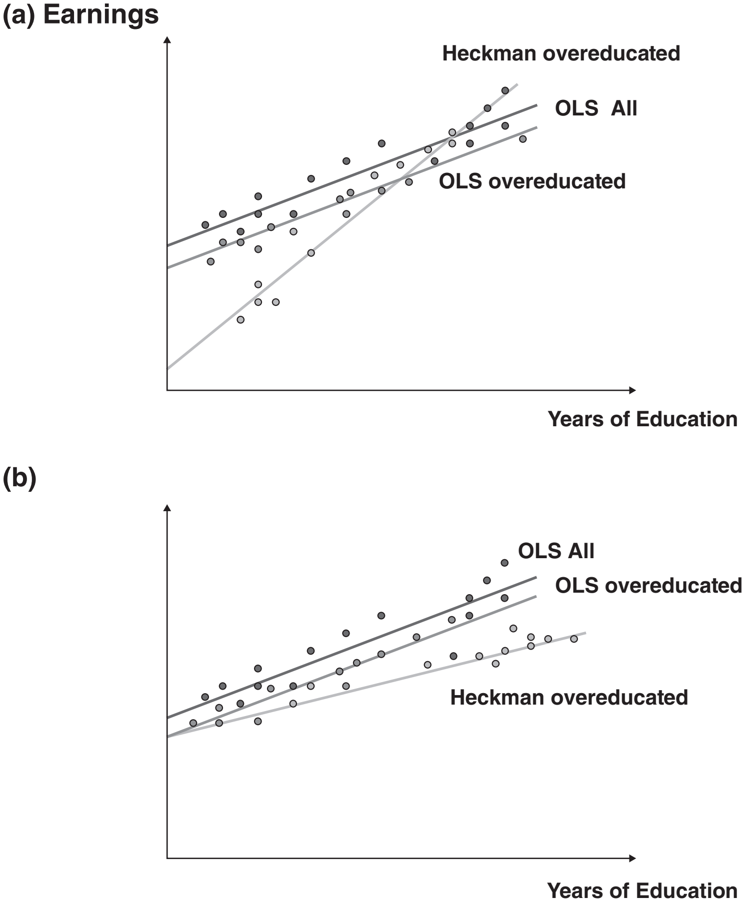

Figure 3.1 Heckman correction of the wage effect of overeducation/overskilling: (a): job competition. job assignment and human capital model; (b) job search model

Controlling for endogeneity and sample selection bias, most authors find that the wage penalty associated with overeducation increases, lending support to the job competition and job assignment models (see, among others, Cutillo and Di Pietro 2006). In addition, the upward bias tends to outweigh the downward bias due to measurement error in panel data analysis (Dolton and Silles 2008).

The case of Italy

The empirical literature on Italy has focused especially on its low level of both demand and supply of human capital. From the demand side, Manacorda and Petrongolo (2000), among others, note that the production structure is still based on traditional labour-intensive manufacturing. Therefore, the origin of the education mismatch could be found in the weak demand for more educated workers compared with the skills set supplied by the education system (Cainarca and Sgobbi 2009). From the supply side, Checchi (2003), Pastore (2009) and Franzini and Raitano (2012), among others, note that Italy has the lowest level and quality of educational attainment of young people as compared to the EU average.[4]

A large literature points to the inefficiency of the education system in providing a sufficient level and composition of skills for the labour market demand. Ordine and Rose (2009), for example, model the hypothesis that inefficient education choices due to the different quality of education supplied by the universities can generate overeducation. It is mirrored not only in the low level of education attainment, but also in the dramatic social immobility. Education attainment is especially low among the poorest segments of the population, due to school tracking (see, among others, Checchi *et al*. 1999; Cappellari 2004; Brunello and Checchi 2007; Bratti *et al*. 2008; Checchi 2010). In addition, Caroleo and Pastore (2012) note a strong correlation between the education level of fathers and that of their children by type of university degree: in particular, most children whose parents both hold a university degree tend to gather in those fields of study that give access to liberal professions, where the intergenerational transfer of human capital is greatest.

All this considered, in principle, it is hard to say whether overschooling is higher or lower than elsewhere. ISTAT, the Italian national statistical office, estimated that there were 1.9 million undereducated (9 per cent of employment) compared to 3.7 million overeducated (16.5 per cent) in 2006. The existing comparative evidence hints that the country has a higher than average share of overeducated workers, suggesting that demand is more at risk of losing the race with the supply of human capital than elsewhere. Horizontal overeducation might also be an important component, due to the paucity of careers advice for high school diploma students, the scant integration of the education system with the labour market and the high share of graduates in humanities and other arts degrees.

In their study of the REFLEX data, McGuinness and Sloane (2010: Table 3.6) find that the extent of the education mismatch in Italy is one of the highest among the EU countries included in their sample (Davia *et al*. 2010; Verhaest and van der Velden 2010). With a share of 23 per cent of overeducated workers at the time of their first job and of 13 per cent five years after graduation, Italy is ranks third last, better than only Spain and the UK, which have overeducation rates of 17 per cent and 14 per cent, respectively, five years after graduation. In other EU countries in the sample, overeducation is almost always under the threshold of 10 per cent.

Slightly different is the case of overskilling, which is much more common in the REFLEX sample and for which Italy tends to the country average. This is due to the tendency of overskilling to be much more common than overeducation. In Italy, overskilling equals 21 per cent at the first job and 11 per cent five years after graduation. Italy is still under Spain and the UK only, but this time also other countries have similar levels, fluctuating from 8 per cent in Portugal and Norway to 19 per cent in Belgium and 21 per cent in France.

Ferrante (2010) uses AlmaLaurea data to assess the impact of a number of individual characteristics on the effectiveness of the university degree in providing a job that is up to the education and skills level of the individual. He reports that the variables that correlate positively and in a statistically significant way with the effectiveness of the university degree in an ordered probit framework include: a high school diploma with a score of 55–60 out of 100; a high final grade at university; a longer length of job search; experience of postgraduate training; and holding a university degree in engineering, chemistry, pharmacy or law. The negative and statistically significant determinants include: holding a technical high school diploma; belonging to the working class; starting their career via starter (so-called atypical) working contracts, such as apprenticeship, *stage*, or temporary contracts; holding an arts degree or a degree in education, psychology or social sciences. Moreover, the author finds a statistically significant positive effect of the effectiveness of the university degree on job satisfaction.

The wage penalty of overeducated or overskilled university graduates is found to be lower in Italy than in other countries and in some case not statistically significant (Wasmer *et al.* 2005; Brynin and Longhi 2009; Ordine and Rose 2009). Using the 2001 ISTAT inquiry into thw professional integration of 1998 graduates, Cutillo and Di Pietro (2006) find a wage penalty for university graduates ranging between 2.4 per cent and 5.7 per cent in simple OLS estimates based on an ISTAT database. McGuinness and Sloane (2010) find a wage penalty of about 10 per cent. Interestingly, in the case of Italy, they find a higher wage penalty for the overskilled (11 per cent) than for the overeducated (4 per cent). The latter is not statistically significant. They also find a wage penalty of about 8 per cent in the case of underskilling.

Using the ISFOL PLUS data, Aina and Pastore (2012) find a strong correlation between overeducation and delayed graduation, and a wage penalty associated with overeducation of about 20 per cent, slightly higher than in previous studies.

According to some authors, the return to education of overeducated graduates is positive even if less than that of well-matched counterparts (Caniarca and Sgobbi 2009; Franzini and Raitano 2012). The low wage penalty associated with the education and skills mismatch suggests that firms have strong incentives to hire a worker holding a university degree rather than a secondary school diploma even if the university graduate is bound to remain overeducated. This can be understood by considering the very high unemployment rate existing traditionally in the country and the abundance of non-employed job seekers especially among the youngest segments of the population. Although lower than that among young people holding a high school diploma, the unemployment rate of university graduates is higher in Italy than in other EU countries. As already noted in the previous section, this poses an apparent problem of sample selection bias when estimating the wage effect of overeducation and seems to support the job competition and job assignment models, rather than the job search theoretical model.

Using an ISTAT survey carried out in 2001 on graduates in 1998, Cutillo and Di Pietro (2006) find that, controlling for endogeneity of overeducation, the wage penalty increases up to between 22 per cent and 39 per cent. Controlling for both endogeneity and sample selection bias, the wage penalty of overeducation rises to about 40 per cent, independent of the sample adopted.

Considering the dramatic geographical differences existing in the country, a potentially relevant issue is whether there is also any divide in the way overeducation manifests itself across regions. In theory, one would expect overeducation to be more common in the South, where the demand for skills is supposedly lower, due to lower development levels. Nonetheless, Franzini and Raitano (2012) find that in the South overeducation is less frequent and bears a lower wage penalty. They explain this finding in terms of the relatively greater share in the South of workers employed in the state sector, where overeducation is less frequent and bears a lower wage penalty. On the other hand, Croce and Ghignoni (2015) find that frictions and barriers increasing the costs of spatial mobility worsen the match in the labour market between education required and education achieved. And, in particular, among the university graduates, movers are less overeducated than stayers and a longer migration distance decreases overeducation risks.

Overeducation in the AlmaLaurea data

Caroleo and Pastore (2013) provide a detailed empirical analysis of overeducation in Italy using the AlmaLaurea database which provides an excellent testing ground to address this issue and to test different theoretical approaches.[5] Their conclusions about the personal attributes of the overeducated are in line with those of the previous literature.

In particular, Table 3.1 provides summary measures of the wage gap derived from different estimated models, including the unconditional estimate, the conditional one and that obtained including controls for sample selection bias. They estimate the unconditional wage penalty both using a traditional OLS specification and regression with intervals considering that wages are measured in the form of interval data. In other words, the respondent is requested to choose one of the wage classes provided in the questionnaire. This involves a non-continuous variable and some bias in the use of the normal OLS estimator.

The unconditional wage gap is relatively high for both overeducation (21–25 per cent) and overskilling (16–21 per cent). In both cases, OLS underestimates the wage penalty as compared to interval regression.

However, the unconditional measure of the wage penalty might capture such factors as the lower than average productivity characteristics of the overeducated or overskilled. In other words, such a high unconditional penalty might disappear when controlling for the lower than average levels and quality of human capital of the overeducated. Such characteristics might be observed or unobserved.

Table 3.1 reports also conditional measures of the wage penalty as obtained in OLS estimates and in interval regressions including all the variables of the AlmaLaurea database as controls. Interestingly, when controlling for the level and quality of human capital, both OLS coefficients are halved. More precisely, the wage penalty of overeducation reduces to 12 per cent and that of overskilling to 7 per cent. Similar reductions are observed in the case of interval regressions.

Our findings provide indirect support for the job competition and job assignment model versus the search theoretical model, suggesting that the non-employed would be more likely to be overeducated if they found a job. In other words, the sample selection correction confirms that there is positive selection

Table 3.1 The wage penalty of overeducation and overskilling

Dependent variable: Natural logarithm of net monthly wages	*Overeducation (to get)*	*Overskilling (to do)*
	(1)	*(2)*
Unconditional estimates		
OLS	–0.2081***	–0.1568***
Interval regression	–0.2463***	–0.2088***
Conditional estimates		
OLS	–0.1220***	–0.0692***
Interval regression	–0.1319***	–0.0967***
Number of observations	16591	16591
Controlling for sample selection bias	Without instrumental variables	
Heckman model (ML simultaneous)	–0.1335***	–0.0758***
Heckman model (two steps)	–0.1336***	–0.0758***
	With instrumental variables (parents' education)	
Heckman model (ML imultaneous)	–0.1225***	–0.0758***
Heckman model (two steps)	–0.1337***	–0.0759***
Number of observations	21605	21605

Note: The table reports only the coefficients of interest. The OLS conditional estimates are obtained with all the control variables included in Table 4. The Heckit based on Maximum Likelihood simultaneous estimate are obtained with all the control variables included in Table 6. The two step estimates are unreported.

Legend: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Source: own elaboration on AlmaLaurea data.

into employment of the most skilled among those experiencing the education/skills mismatch with respect to labour demand. This finding is partly in line with that of Cutillo and Di Pietro (2006) based on different data.

Concluding remarks

This chapter provides a detailed survey of the literature on overeducation, in an attempt to interpret the education mismatch as linked to both insufficient demand for skills and the inefficiency of the school-to-work transition in producing the skills that the labour market requires.

The literature on the role of demand-side factors is still tentative, since most of it is based on a microeconomic approach and on individual-level data. The interpretation proposed in some recent contributions is that the insufficient demand for skills, especially after an expansion of the supply of skills, as has been taking place in Europe in the last two decades, is an obvious factor in overeducation in most countries. Nonetheless, as also the most recent theory of endogenous technical change would predict, an expansion of the supply of skills might be followed by a process of technological innovation which could develop, in turn, the demand for skills. In other words, the education and skills mismatch would be temporary phenomena which will be absorbed when the economy returns to growth.

It is likely that the technological poverty of many EU countries, especially in southern Europe, explains most of the education mismatch, especially that in terms of overskilling. This is especially true in those countries, like Italy, where the production system is oriented towards traditional manufacturing sectors and therefore the demand for human capital is expected to remain low and stable.

We have argued that overeducation in Italy is also associated with an inefficient school-to-work transition system which does not allow young people to develop their work-related skills, because of the lack of links between the education system and the labour market.

Special mention has been made of research on the wage penalty associated with overeducation for individuals and therefore from a microeconomic point of view. The results show a relatively high unconditional wage penalty for both overeducation and overskilling, partially offset when controlling for the lower than average levels and quality of human capital of the overeducated.

The policy implications of our analysis are that, taking for granted the necessity of policies tackling the low productivity growth rate, it is important also to advance the school-to-work transition system and, in particular, the links of the education and training systems to the labour market. In this sense, it is important that the dual principle be introduced and spread also in tertiary education. Alternatively, more job opportunities and starter contracts should be offered to fresh graduates, so as to develop sooner their work-related skills.

Acknowledgements

Previous versions of this paper have been presented at: AlmaLaurea Conference, University of Bologna (11 March 2011), IAB of Nuremberg (26 May 2011), XXVI AIEL Conference, Catholic University of Milan (15 September 2011), University of Naples ‘Parthenope’ (30 September 2011), University of Naples ‘Federico II’ (26 October 2011), Second University of Naples (22 December 2011), XXVII AIEL Conference (27–28 September 2012), University of Pescara (2012); University of Salerno (2013). We thank all seminar participants. We are also grateful to Lilia Costabile, Giuseppe Croce, Hans Dietrich, Francesco Ferrante, Claudio Lucifora, Nadia Netti, Patrizia Ordine, Marco Pecoraro, Claudia Pigini, Giuseppe Rose, Dario Sciulli, Francesca Sgobbi, Peter Sloane and an anonymous referee for valuable comments. This notwithstanding, the authors are solely responsible for the opinions expressed in this paper.

Notes

1 The next section provides a discussion of the different theories of overeducation at an individual level and of the underlying hypothesis regarding the equilibrium level of the market for skills.

2 For a slightly different interpretation of the sample selection bias test, see later in this chapter, and also Caroleo and Pastore (2013).
3 REFLEX is a survey carried out among a representative sample of 1999/2000 graduates from tertiary education in 16 European countries (Allen and van der Velden 2007).
4 In the last decade, Italy has witnessed several reforms of the university system aimed at reducing the indirect cost of education, one of the highest in the world, due to the long time that it takes to obtain a degree and complete the school-to-work transition (Pastore 2009). As a consequence, the number of graduates has slightly increased, although at a slower pace than the EU average, making the country still one of the lowest in terms of educational levels in Europe.
5 AlmaLaurea is a consortium including a large and growing number of Italian universities. The aim of the consortium is to provide a framework to ease the interaction of graduates and firms by collecting the curricula of graduates and making them available to firms wishing to fill job vacancies. Further support is given to the universities, providing them with homogenous information on the quality of the education achieved. It also collects valuable information on the individual and educational characteristics of graduates at the time of graduation and on their employment status 1, 3 and 5 years after graduation.

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Table A.1 Survey of the empirical literature on Italy

	Data	*Overeducation indicator*	*Results*
Quintano. Castellano. D'Agostino (2008)	Sample of graduates in Economics at University of Naples Parthenope by graduation year (1999–2002). Date of interview: spring 2005	The authors derive two indicators from the self-declared answers to the questionnaire. a) **overskilling or Objective indicator** (i.e. the formal necessity of having the university degree in order to apply for the job). b) **overeducation or Combined indicator**: who respond that university degree is not formally necessary plus all graduates who feel that the substantial need of a university degree is excessive. **Earning indicator**: dichotomous measure that divides more disadvantaged graduates from the others (+ or −1100 € per month)	To be overeducated is a strong predictor of the probability of having low earning. (0.39* for the objective Ind.) (0.44* for the combined ind.)
Ferrante. McGuinnes. Sloane (2010)	Alam Laurea: Sample (17000) of the graduate population in Italy in 2004 interviewee in 2009	**Indicator of overskilling or effectiveness**: if skills acquired during university are utilized in the present job. **Indicator of overqualification**: if the degree level is necessary or useful to do the job. **Indicator of efficacy**: combination of effectiveness indicator plus overqualification indicator. Earning indicator: not defined	Results of the mismatch indicators on the probability to be employed are not presented. Descriptive statistics show that 11% of the graduates employed are overskilled and 7% are overqualified five years after the degree.
Ferrante. McGuinnes. Sloane (2010)	International data set REFLEX. Graduate in 1999/2000 in 13 European countires interviewee in 2005	**Overeducated** who feel for a present job more adequate a title lesser than a university degree (vertical mismatch). **Overskilled**: if skills acquired during university are not utilized in the present job (horizontal mismatch). **Earning indicator**: wage level (si parla di earning equation e di livelli retributivi)	In Italy the wage penalty of the overeducated is not significant (−0.04). In the other countries the coefficent is high and significant. To be overskilled has a wage penalty significative and in line with the other countries sach as France. Netherland end UK (−0.11**)

(*Continued*)

Table A.1 (Continued)

	Data	*Overeducation indicator*	*Results*
Franzini and Raitano (2009)	Data Set Plus. Survey of 2005. Sub-sample of all dependent full time workes	Overeducation or subjective direct indicator (i.e. the formal necessity of having the university degree in order to apply for the job). Earning indicator: ORU (Overeducation Required Undereducation model) Method. based on the surplus years of education i.e. the difference between the mode years of education of the qualification held and of the one required for the job.	To have a university degree augments the probability of higher wages (21.65***). To be not overedutated performs better (22.64***). To be overeducated performs lesser than to be not overeducated (17.02***) but the coefficient is positive. This if we refer to the all dependent full time workers. The overeducated dependent full time workers with university degree have a wage penalty of −5.15%***. But this decrease and become not significative when we add indices of individual abilities.
Brynin and Longhi (2009)	The data derive from the "e-Living project" funded by the EU. The project was based on a household survey of 1750 households in 4 countries—Britain, Germany, Italy, and Norway	Three indicators: the first wirh the '**certification method**' is best calculated from a direct comparison of qualifications held and required. The second method is a version of the traditional **ORU specification:** it defines excess education as the difference between actual years of education and the average years associated with the qualification necessary for a job. The third is the **'Combined' definition:** the (temporal) overeducation is the difference in years of education between individual i and the majority of people with the same qualification.	The results of the estimation wiht the **certification indicato**r show in all countries except Germany a matched graduate earns more than an overqualified graduate (in Italy we have the higher coefficients (0.922 vs 0.719). In all countries except Norway (where the difference is slight). someone matched with a higher school leaving qualification earns more than someone overqualified at the same level. Certification indicator in Italy generates a premium. The results of **ORU specification** reveal that in all four countries the effect of education required for the job is positive, also greater than that of years of education. The effects of excess education are either positive, but with little statistical significance, or zero, **Combined definition:** In Italy nor excess qualifications (converted into years of education) nor extra time in education have effect on earnings

Di Pietro and Urwin (2006)	The data are taken from a survey carried out by ISTAT (National Statistical Italian Centre) in 1998 on individuals who graduated from all Italian universities in 1995. (17.326 individuals)	Four dummy variables. The first one (**EDMIS**) takes a value of 1 if a university degree was not a formal requirement for the graduate's current job, and 0 otherwise. Similarly, the second dummy variable (**OVERED**) has a value of 1 if the worker considers their level of education to be excessive, relative to the job tasks they have to perform, and 0 otherwise. The third dummy variable (**UNDERED**) takes a value of 1 if a worker feels that their level of education is insufficient, relative to the job tasks. Finally, with respect to skill mismatch, it has been constructed a dummy variable (**SKIMIS**) which takes the value 1 if graduates respond that they have used either "none" or "a little" of the knowledge and skills acquired at university in their current jobs, and 0 otherwise.	The coefficient on over-education (OVERED) is found to be negative and statistically significant, whereas that on under-education (UNDERED) is neither in line with expectations nor statistically significant. The results indicate that over-qualified graduate workers earn, on average. 5.1% less than those with the same qualification level who occupy jobs for which they are adequately qualified. The indicator of skill Underutilization (SKIMIS) has a negative impact on earnings (1.5%). When we combine the employed indicators for education and skills mismatch are combined, we fund that effect of under-utilisation of skills on wages disappears when controlling for educational mismatches, while the value of the coefficient on over-education is largely unchanged. Adding the indicator for educational mismatch constructed (EDMIS), the findings indicate that graduates working in jobs for which a university degree was not formally required. receive lower wages than other graduates who occupy jobs for which a degree was a formal requirement. The wage penalty is of 3.6%.
Di Pietro and Cutillo (2006). IJM	The individual-level data are taken from a survey carried out in 2001 by the ISTAT on people who graduated from Italian higher education institutions in 1998	Overeducation is measured through the worker self-assessment method. **Overeducated** are graduates who respond not to the question: 'Was a university degree a formal requirement to obtain your current job?'. The estimate effect of overeducation on wage are done by a simple OLS and by IV model to take account for the endogeneity of overeducation. However, it has been demonstrated that, using a single selection framework. the estimate effects is	The estimated pay penalty associated with overeducation under OLS and when we correct for sample selection bias due to the decision to work is approximately 4.4%. The estimate of the negative effect of overeducation on earnings rises to 39.4% and 5.7% once we take the endogeneity of overeducation into account using the Heckman and the IV estimation techniques respectively. The wage differential between appropriately

(*Continued*)

Table A.1 (Continued)

	Data	Overeducation indicator	Results
		downwrad biased as it don't thake in account the problem of sample selection bias and of endogeneity bias. To go beyond the failure of controlling for this correlation yields the relationship between overeducation and wages has been investigated using a double selection approach where two basic individuals' decisions are considered: the decision to work and the choice of occupation. **Wage indicator**: natural logarithm of the basic hourly wage	educated and overeducated workers (measured at the all workers mean), using the bivariate selectivity model is of 39.0%.
Wasmer *et al.* (2005)	The authors use the European Community Household Panel (ECHP) Data set. The analysis is concentrated on the five largest countries of the EU-15; namely, France, Germany, Italy, Spain and the UK, but also summary statistics for all EU-15 countries in an attempt to provide a full picture of the skill mismatch phenomenon are presented	For indicators are used: Type 1. "Non-over-qualified and well matched" (**NOWM**). if non-over-qualified and education and training is suited for their job. Type 2. "Non-over-qualified and mismatched" (**NOBM**), if non-over-qualified but education and training is not suited for their job. Type 3. "Over-qualified but correctly matched" (**OWM**). if over-qualified but education and training are suited for their job. Type 4. "Over-qualified and mismatched" (**OBM**). if over-qualified and education andtraining are not suited for job. **Wage equation**: standard Mincer regression augmented to include a dummy variable for overqualification and in a second stage authors differentiate between the different types of mismatched workers.	For the pooled countries overqualified workers have a wage penalty with respect to properly matched employees. However, the magnitude of the effect is relatively small (1% lower wages) Moreover, the pooled results hide important differences across countries. Since it is only in Spain where the wage penalty of over-qualified workers is negative and statistically significant. Distinguishing between the three different types of skill mismatch. NOBM, OWM, OBM (and taking NOWM as reference group). NOBM, OWM present a negative return in all countries. In Italy, as well as in the other countries, the effect is large: on average NOBM and OBM workers earn about 10.5% less that properly matched individuals. If instead the individual has the skills required for the job (well matched) but is over-qualified (OWM).

			A wage penalty is found only in the cases of Spain and Italy. It should be noted that even if significant the magnitude of the wage penalty from being OWM is about one third of the wage penalty in case of being badly matched (OBM) in all countries. Thus, the authors conclude that in the five EU countries studied it is to a large extent skill mismatch what drives the wage penalty on wages and not over-qualification
Cainarca and Sgobbi (2009)	the data are taken from the OAC-ISFOL survey on employees in industrial and service private sector in 2004	**The educational mismatch** is defined as the correspondence between the education level possessed and the task performed. It has beeen measured comparing the education level and the self declared answer to the question: «Se qualcuno dovesse fare domanda per occupare la sua posizione. che qualificazione scolastica dovrebbe possedere secondo lei?» (En.Tr.: "If somebody should apply for your job. which kind of qualification would he need to hold?).	In the sample overeducated are the 14.1% over total employees and undereducated are the 17.1%. The wage penalty is estimated by an ORU specification. As usual the years of undereducation have a negative impact on wages (−1.9) and the years of overeducation have a positive impact (0.9) even if the premium is only a quater of that of the years of education.
Verhaest and van der Velden (2010)	International data set REFLEX. Graduate in 1999/2000 in 13 European countires interviewee in 2005	**Overeducated** are workers who feel for a present job more adequate a title lesser than a university degree (vertical mismatch). Earning indicator: not defined	The incidence of overeducation six months after graduation in Italy is 38.0% and five years after graduation is 19.3%. On average, in the main OECD countries the incidence of overeducation is about 10% lower in the current job (26.0%) compared to the first job (15.6%). Italy has a high initial incidence of overeducation and, like the other countries in the same situation. has the largest drop after five years. Italy is also characterized by an overall low stability of match positions: this country combines a below average overeducation persistence with a relatively high probability to fall back in overeducation after an initial good match.

(*Continued*)

Table A.1 (Continued)

	Data	*Overeducation indicator*	*Results*
Davia. McGuinness. O'Connell (2010)	The data come from the 2004, 2005 and 2006 waves of the EU Survey on Income and Living Conditions (EU-SILC)	Individuals are defined as being **overeducated** if their level of attained schooling is at least one level above the mode of their occupation. measured at the 2 digit ISIC level. Earning indicator: not defined	The average overeducation rate in Italy in 2004–2006 is 25.4% for males and 30.6% for females. Compared with the other countries the Italian rate is one of the highest and in particular the country exhibites relatively high levels of regional variation.
Ordine and Rose (2009)	The individual-level data are taken from a survey carried out in 2004 by the ISTAT on people who graduated from Italian higher education institutions in 2001	**Overeducated** is who answer not to the question: «Is your degree a required qualification for your job?». Wage indicator: log of the basic hourly wage	A wage equation is estimated in wich tha occurrence of overeducation is included as explanatory variable. Wage impact of overeducation is relevant (coefficient od OLS -0.084) and significant, meaning that mismatched graduates earn consistently less that their matched peers and this may influence the pattern of wage inequality within the group of graduates.

Source: Own elaboration.

4 Should I stay or should I go? Dropping out from university

An empirical analysis of students' performances

Roberto Zotti

Introduction

The role of human capital has been widely discussed in the literature, and empirical evidence of a positive relationship between quantitative (years of studying) and qualitative (knowledge acquired) education measures and earnings has been widely demonstrated.[1] Individuals with a tertiary level of education have a greater chance of finding a job,[2] a lower unemployment rate,[3] a higher possibility of having a full-time contract,[4] and earn more[5] than those who do not have a university degree (OECD 2011). However, in recent decades, the problem of interrupted careers has become a growing concern, given that a substantial number of students enter the higher education system and leave without at least a first degree;[6] according to Lambert and Butler (2006),

> high drop-out rates are a sign either that the university system is not meeting the needs of its students, or that young people are using universities as a convenient place to pass a year or two before getting on with their lives. In a mass access system with no selection and high youth unemployment rates, it may be quite rational for a student to sit around for a year or two before dropping out. But this is hardly an efficient use of public resources.

The Italian context is a particularly interesting case in point as "the reduction of drop-out rates is also at the core of recent reforms of the national university system, as increased retention has become the goal of many quality assessments and reorganizational efforts in Italian higher education institutions" (Belloc *et al*. 2010); indeed, even though it is not the aim of this chapter to discuss the institutional setting of the Italian higher education system, it has to be said that its structure was reformed mainly in the 1990s and at the beginning of the 2000s, leading, as Agasisti (2009) emphasized, to a more competitive environment for the assignment of public funds (for an analysis of the potential causality between the reforms implemented and the dropout phenomenon, see, among others, Cappellari and Lucifora 2009; Di Pietro and Cutillo 2008). Universities have started to be funded according to their quality, and both quantitative and qualitative indicators

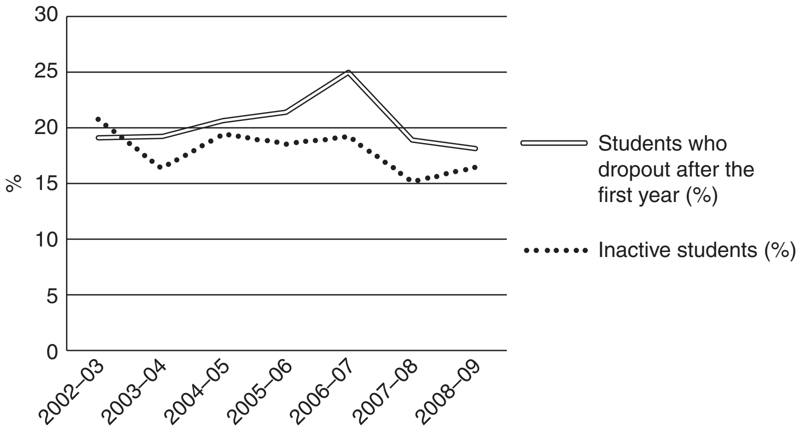

Figure 4.1 Post-reform persistence indicators, from 2002–3 to 2008–9

were developed to accurately evaluate their productivity; among these indicators,[7] there is also the number of students who leave university. Specifically, attention has mainly been paid to the transition between the first and second year, considered as one of the weaknesses of the Italian higher education system (CNVSU 2011). In recent years the percentage of students dropping out after the first year has fallen but is still very high. Specifically, from academic year 2002–3 to academic year 2008–9, on average 20.35 percent of entrants in Italian tertiary education institutions did not enroll in the second year (CNVSU 2011). Dung the same period, 18.02 percent of entrants could be considered inactive, meaning that these students did not acquire any credit during the first year of university (see Figure 4.1). Thus, because of both financial issues and the implications for employment, understanding the decision to withdraw has become a very important element of discussion in the higher education environment (see Belloc *et al.* 2010).

Using a unique administrative dataset of 56,807 first-year students from a large Italian university based in the South of Italy (the University of Salerno), from academic year 2002–3 to academic year 2010–11, this chapter examines the determinants of university dropout, focusing on the transition between the first and second year. The main goal is to contribute to the existing literature on students' withdrawal, focusing on individuals' basic demographics, educational background and pre-enrollment characteristics, and households' financial conditions. The analysis focuses specifically on data from one university only; although this might give rise to concern regarding the external validity of the results obtained, in this way additional sources of heterogeneity which can influence students' performance (namely the factors that influence the size of the teaching budgets across different institutions) are completely eliminated. In order to perform the analysis, a broader and more accurate dropout definition than the formal one used by university administration offices has been employed. Indeed, in line with some previous research,[8] a student drops out both when he/she officially withdraws from the university (the so-called *rinunciatari*) on presenting a formal request to the student office, and when he/she does not renew his/her registration. Moreover, since the first attempts to understand the dropout phenomenon in higher education (see Tinto, 1975), an important issue has been failing to separate permanent from temporary dropout[9] as well as transfer behaviors. Failure to make this distinction has often led institutional and state planners to substantially overestimate the extent of dropout from higher education. Thus, in order to avoid putting together forms of leaving behavior different in their characteristics, students who do not renew their registration but ask to move to another university (differently from the approach used in some previous research[10]) are not considered as dropouts. Moreover, students who do not renew their registration but are found to be enrolled in another faculty of the University of Salerno are not considered dropouts either. The empirical evidence shows that students' characteristics, such as type of high school attended, high school diploma score, gender, age, and household financial conditions, play an important role in students' decision to drop out. Estimates are robust to different structures of the error terms. The rest of this chapter is organized as follows. I begin by examining existing studies on higher education dropout. I then describe the dataset and the empirical strategy, and summarize the results. Finally, conclusions are presented, including some implications for policy.

Related literature

Student attrition in higher education institutions is a multifaceted problem, and economic, sociological, and psychological factors have to be taken into account. Students may leave the tertiary education system for various reasons, such as a lack of social (i.e. participation in the university's activities) and academic (i.e. low grades) integration, information about other opportunities or their own abilities emerging after enrollment, a mismatch with the quality standards required by the institution, financial problems, an evaluation of the opportunity cost of education or an inaccurate prediction about the returns from education in the job market.

Since the early studies in the 1970s (see the theoretical model proposed by Tinto 1975),[11] the empirical evidence shows that students' social and academic integration (referred to, respectively, as institutional commitment and goal commitment) strongly influence whether they stay on (so-called *persistence*) at university (Pascarella and Chapman 1983; Pascarella and Terenzini 1980). Specifically, the role of universities' social and academic organization has been also investigated (for evidence on high school dropout, see Lee and Burkam 2003). Also, as in a labor economics scenario,[12] whether or not the student drops out is related to the quality of the matching process with the higher education institutions. Specifically, the relationship between student ability and the quality of the universities has been taken in consideration. Low-ability students have a higher probability of dropping out from high-quality institutions than they have from low-quality institutions. In other words, university quality does matter (see Light and Strayer 2000;[13] see also Hanushek *et al*. 2006 for the primary school environment). The higher the quality of the university's teaching, the lower the student's propensity to drop out (Johnes and McNabb 2004).[14]

Examining another aspect of the matching problem such as integration within the university, evidence has been found that students who attend university in the same region as their parental home have a higher dropout probability than others, since they may not be as well integrated with their colleagues as other students (Johnes and McNabb 2004). Based on Bean's theoretical model (Bean 1980, 1982a),[15] the empirical evidence suggests that student attitudes, the level of integration into the university and factors external to the university environment (such as family approval of the choice made, the encouragement of friends to continue studying, the financial situation, and the perceived opportunities to change university) strongly influence the student decision to drop out (Bean 1982a, 1982b; Bean and Vesper 1990). Credit constraints might also be strongly related to the decision to leave the university. Students might not be able to finance the *ex ante* optimal level of higher education (Carneiro and Heckman 2005) or might even underestimate the future schooling returns in term of higher earnings (Kjelland 2008).

Other factors which are linked to higher education students' persistence are family related. The family's socioeconomic status (Belloc *et al*. 2010) and the parent's education seem to be inversely related to dropout (Cingano and Cipollone 2007; D'Hombres 2007;[16] Di Pietro and Cutillo 2008;[17] Cappellari and Lucifora, 2009). Regarding the role of the cultural and economic capacity of the family in the educational investment decision, see also O'Higgins *et al*. (2007), for theoretical and empirical evidence on high school dropout. Students who persist with higher education seem to come from families in which more open, more supportive and less conflictual relationships have been built (Trent and Ruyle 1965) and where parents have higher expectations for their children's education (Hackman and Dysinger 1970). Some factors are also related to high school, and evidence of the importance of pre-college preparedness has been found (Noel *et al*. 1985; Fielding *et al*. 1998; Smith and Naylor 2001); students with a higher probability of dropping out seem to come from vocational school (Cingano and Cipollone 2007; Boero *et al*. 2005). High school diploma score has been shown to be an important predictor of persistence: students with a higher diploma score are less likely to drop out[18] (Di Pietro and Cutillo 2008; Aina 2010). Tertiary education persistence also depends on work commitments. Full-time students have a lower probability of dropping out than part-time students (Bean and Metzner 1985; De Rome and Lewin 1984).

Data and empirical specification

The empirical analysis was carried out on a repeated cross-section of 56,807 first-year students[19] from a large Italian university based in the South of Italy from 2002–3 to 2010–11. The institution includes nine faculties and around 50 degree courses. To give some idea of its size and financial commitments, in the last decade about €90 million have been invested every year on human resources (both academic and non-academic) and over 40,000 students are currently registered.

The total university turnover has been fluctuating in the same period around €100 million. Students mostly come from the neighboring area and are of middle-class background. The university has its headquarters in a small town which lies a few kilometers east of the main city in the area – a city whose population is slightly above 100,000 inhabitants, and whose income per capita lies around the national average – to which it is well connected by a motorway. The dataset gathers information about the students' basic demographics (gender, age, residence),[20] educational background and pre-enrollment characteristics (type of high school attended, high school final exam scores), households' financial conditions (family self-declared income),[21] and general information about university careers (having enrolled immediately after obtaining high school diploma, being a part-time student). Descriptive statistics are presented in Table 4.1.

Table 4.1 Definition of variables and sample means (Standard deviations in parentheses)

Variable name	*Variable definition*	*Sample mean*
Outcome variables		
Dropout	1 if drops out at the end of the first year; 0 otherwise	0.4175 (0.4931)
Gender		
Males	1 if male; 0 otherwise	0.4590 (0.4983)
Individual characteristics		
Age	Age in years at the beginning of the enrollment year	21.0733 (5.1749)
Age^2	Age in years at the beginning of the enrollment year squared	470.8637 (323.8445)
Residence	Residence distance from the University campus	42.1504 (59.7587)
$Residence^2$	Residence distance from the University campus squared	5347.69 (38689.17)
Type of high school		
Scientlyc	1 if attended scientific lyceum; 0 otherwise	0.3328 (0.4712)
Classlyc	1 if attended classical lyceum; 0 otherwise	0.1078 (0.3101)
Linglyc	1 if attended linguistic lyceum; 0 otherwise	0.0509 (0.2198)
Techninst	1 if attended technical Institution; 0 otherwise	0.2956 (0.4563)
Profinst	1 if attended professional Institution; 0 otherwise	0.0941 (0.2920)
Otherinst	1 attended other institutions; 0 otherwise	0.1186 (0.3233)

(*Continued*)

Table 4.1 (Continued)

Variable name	*Variable definition*	*Sample mean*
Diploma score		
Score	High school final exam score	78.8857 (12.5943)
Family income		
Low income	1 if declared family income from €0 to €12,000.00; 0 otherwise	0.4787 (0.4995)
Medium income	1 if declared family income from €12,000.01 to €32,000.00; 0 otherwise	0.3500 (0.4769)
High income	1 if declared family income higher than €32,000.01; 0 otherwise	0.1685 (0.3743)
Enrollment characteristics		
Gap_time	1 if enrolled in the year of the diploma; 0 otherwise	0.8163 (0.3872)
Part_time	1 if part-time student; 0 otherwise	0.0332 (0.1792)

The econometric model is given by

$$y^*_{ij} = \alpha + X_{ij}\beta + \varepsilon_{ij} \tag{4.1}$$

where the observed values of y are outcomes for individual i enrolled in faculty j. X is a vector of exogenous variables, such as students' individual characteristics, educational background and pre-enrollment characteristics, financial conditions, and enrollment information. β represents a set of parameters to be estimated and ε is an error term. For the identification of the dropout probability a binomial probit model has been used where $y = 1$ if the student drops out[22] and $y = 0$ otherwise.

Results

Estimates of equation (4.1) are presented in Tables 4.2 and 4.3. For all the outcomes five estimates for the standard errors are reported. Column 1 in Table 4.2 reports standard errors robust to heteroskedasticity, column 2 reports standard errors clustered at faculty and year level, whereas column 4 reports standard errors clustered at curriculum and year level. Cluster-adjusted standard errors correct for the possible correlation in performance of students enrolled in the same faculty and curricula over time. Faculties are the main organizational units where teaching takes places. Through the faculties, universities organize their activity in the various subject areas. Faculties coordinate subject courses and arrange them within the different degree programs; they appoint academic staff and decide, always respectful of the principle of freedom of teaching, how to distribute roles

Table 4.2 Estimated coefficients from the probit model for withdrawing students

All covariates	*(1) Dropout between year1 and 2*	*(2) Dropout between year1 and 2*	*(3) Dropout between year1 and 2*	*(4) Dropout between year1 and 2*	*(5) Dropout between year1 and 2*
Gender (reference: females)					
Males	0.122***	0.122***	0.122***	0.122***	0.122***
	(0.013)	(0.018)	(0.017)	(0.017)	(0.017)
Individual characteristics					
Age	0.163***	0.163***	0.163***	0.163***	0.163***
	(0.007)	(0.009)	(0.009)	(0.009)	(0.010)
Age^2	–0.002***	–0.002***	–0.002***	–0.002***	–0.002***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Residence	–0.0006***	–0.0006***	–0.0006***	–0.0006***	–0.0006***
	(0.0001)	(0.0001)	(0.0002)	(0.0002)	(0.0002)
$Residence^2$	7.65e-07***	7.65e-07***	7.65e-07**	7.65e-07**	7.65e-07**
	(2.86e-07)	(2.93e-07)	(3.08e-07)	(3.03e-07)	(3.43e-07)
Type of high school (reference: scientific lyceum)					
Classlyc	0.024	0.024	0.024	0.024	0.024
	(0.020)	(0.035)	(0.034)	(0.028)	(0.026)
Linglyc	0.161***	0.161***	0.161***	0.161***	0.161***
	(0.028)	(0.036)	(0.036)	(0.033)	(0.030)
Techinst	0.358***	0.358***	0.358***	0.358***	0.358***
	(0.014)	(0.026)	(0.026)	(0.020)	(0.019)
Profinst	0.528***	0.528***	0.528***	0.528***	0.528***
	(0.021)	(0.034)	(0.032)	(0.027)	(0.026)
Otherinst	0.339***	0.339***	0.339***	0.339***	0.339***
	(0.021)	(0.035)	(0.031)	(0.029)	(0.033)

(*Continued*)

Table 4.2 (Continued)

All covariates	*(1) Dropout between year1 and 2*	*(2) Dropout between year1 and 2*	*(3) Dropout between year1 and 2*	*(4) Dropout between year1 and 2*	*(5) Dropout between year1 and 2*
Diploma score					
High School Marks	–0.023***	–0.023***	–0.023***	–0.023***	–0.023***
	(0.0004)	(0.0009)	(0.0008)	(0.0007)	(0.0007)
Family Income					
Medium Income	–0.079***	–0.079***	–0.079***	–0.079***	–0.079***
	(0.012)	(0.011)	(0.011)	(0.012)	(0.03)
High Income	–0.013	–0.013	–0.013	–0.013	–0.013
	(0.016)	(0.020)	(0.019)	(0.019)	(0.019)
Enrollment characteristics					
Gap_time	–0.095***	–0.095***	–0.095***	–0.095***	–0.095***
	(0.016)	(0.020)	(0.020)	(0.019)	(0.018)
Part_time	0.247***	0.247***	0.247***	0.247***	0.247***
	(0.034)	(0.036)	(0.036)	(0.035)	(0.036)
Faculties – Reference Economics					
Pharmacy	0.141**	0.141	0.141	0.141	0.141
	(0.058)	(0.104)	(0.128)	(0.101)	(0.099)
Engineering	0.248***	0.248***	0.248***	0.248***	0.248***
	(0.018)	(0.080)	(0.085)	(0.050)	(0.051)
Art & Philosophy	–0.146***	–0.146***	–0.146***	–0.146***	–0.146***
	(0.017)	(0.046)	(0.048)	(0.050)	(0.052)
Languages	–0.032	–0.032	–0.032	–0.032	–0.032
	(0.026)	(0.064)	(0.070)	(0.077)	(0.078)

(*Continued*)

Table 4.2 (Continued)

All covariates	*(1) Dropout between year1 and 2*	*(2) Dropout between year1 and 2*	*(3) Dropout between year1 and 2*	*(4) Dropout between year1 and 2*	*(5) Dropout between year1 and 2*
Educational Sciences	–0.203***	–0.203***	–0.203***	–0.203***	–0.203***
	(0.021)	(0.073)	(0.064)	(0.063)	(0.074)
Maths, Phys. & Nat Sc.	0.048**	0.048	0.048	0.048	0.048
	(0.018)	(0.063)	(0.073)	(0.047)	(0.051)
Political Sciences	0.049**	0.049	0.049	0.049	0.049
	(0.023)	(0.055)	(0.058)	(0.046)	(0.051)
Year fixed effects	Yes	Yes	Yes	Yes	Yes
No. of obs.	56807	56807	56807	56807	56807
Wald $\chi^2(30)$	7180.25	2928.38	3970.53	3136.67	6301.01
Prob > χ^2	0.0000	0.0000	0.0000	0.0000	0.0000
Log-likelihood	–34479.843	–34479.843	–34479.843	–34479.843	–34479.843
Pseudo R^2	0.1067	0.1067	0.1067	0.1067	0.1067

(1) Standard errors robust to heteroskedasticity; (2) standard errors clustered faculty and year; (3) standard errors clustered faculty and year bootstrap (1000 replications); (4) standard errors clustered curricula and year; (5) standard errors clustered curricula and year bootstrap (1000 replications)

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 4.3 Estimated coefficients from the probit model for withdrawing students by gender

All covariates	*(1) Dropout between year1 and 2*		*(2) Dropout between year1 and 2*		*(3) Dropout between year1 and 2*		*(4) Dropout between year1 and 2*		*(5) Dropout between year1 and 2*	
	Males	*Females*	*Males*	*Females*	*Males*	*Females*	*Males*	*Females*	*Males*	*Females*
Individual characteristics										
Age	0.148***	0.172***	0.148***	0.172***	0.148***	0.172***	0.148***	0.172***	0.148***	0.172***
	(0.010)	(0.010)	(0.012)	(0.013)	(0.012)	(0.012)	(0.012)	(0.013)	(0.014)	(0.013)
Age^2	–0.001***	–0.002***	–0.001***	–0.002***	–0.001***	–0.002***	–0.001***	–0.002***	–0.001***	–0.002***
	(0.0001)	(0.0001)	(0.0001)	(0.0002)	(0.0001)	(0.0002)	(0.0001)	(0.0002)	(0.0002)	(0.0001)
Residence	–0.0003	–0.0009***	–0.0003	–0.0009***	–0.0003	–0.0009***	–0.0003	–0.0009***	–0.0003	–0.0009***
	(0.0001)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0003)	(0.0002)	(0.0002)	(0.0002)
Residence^2	–5.47e-08	1.26e-06***	–5.47e-08	1.26e-06***	–5.47e-08	1.26e-06***	–5.47e-08	1.26e-06***	–5.47e-08	1.26e-06***
	(4.42e-07)	(3.74e-07)	(4.53e-07)	(3.54e-07)	(4.48e-07)	(3.45e-07)	(4.80e-07)	(3.78e-07)	(4.74e-07)	(3.74e-07)
Type of high school (reference: scientific lyceum)										
Classlyc	0.060*	–0.004	0.060	–0.004	0.060	–0.004	0.060	–0.004	0.060	–0.004
	(0.032)	(0.026)	(0.042)	(0.040)	(0.045)	(0.039)	(0.038)	(0.032)	(0.036)	(0.034)
Linglyc	0.366***	0.121***	0.366***	0.121***	0.366***	0.121***	0.366***	0.121***	0.366***	0.121***
	(0.074)	(0.031)	(0.076)	(0.038)	(0.082)	(0.040)	(0.069)	(0.036)	(0.073)	(0.037)
Techinst	0.386***	0.341***	0.386***	0.341***	0.386***	0.341***	0.386***	0.341***	0.386***	0.341***
	(0.018)	(0.023)	(0.032)	(0.030)	(0.026)	(0.030)	(0.024)	(0.030)	(0.025)	(0.031)
Profinst	0.610***	0.471***	0.610***	0.471***	0.610***	0.471***	0.610***	0.471***	0.610***	0.471***
	(0.033)	(0.028)	(0.041)	(0.039)	(0.037)	(0.043)	(0.038)	(0.034)	(0.042)	(0.035)
Otherinst	0.506***	0.307***	0.506***	0.307***	0.506***	0.307***	0.506***	0.307***	0.506***	0.307***
	(0.053)	(0.024)	(0.054)	(0.037)	(0.052)	(0.035)	(0.058)	(0.032)	(0.060)	(0.033)
Diploma score										
High School Marks	–0.026***	–0.026***	–0.026***	–0.026***	–0.026***	–0.026***	–0.026***	–0.026***	–0.026***	–0.026***
	(0.0007)	(0.0007)	(0.001)	(0.001)	(0.0011)	(0.001)	(0.0009)	(0.0009)	(0.0009)	(0.001)
Family income										
Medium Income	–0.063***	–0.099***	–0.063***	–0.099***	–0.063***	–0.099***	–0.063***	–0.099***	–0.063***	–0.099***
	(0.018)	(0.017)	(0.017)	(0.016)	(0.018)	(0.017)	(0.017)	(0.017)	(0.017)	(0.016)
High Income	–0.033	0.012	–0.033	0.012	–0.033	0.012	–0.033	0.012	–0.033	0.012
	(0.023)	(0.023)	(0.025)	(0.024)	(0.028)	(0.026)	(0.024)	(0.025)	(0.026)	(0.025)

(*Continued*)

Table 4.3 (Continued)

All covariates	*(1) Dropout between year1 and 2*		*(2) Dropout between year1 and 2*		*(3) Dropout between year1 and 2*		*(4) Dropout between year1 and 2*		*(5) Dropout between year1 and 2*	
	Males	*Females*	*Males*	*Females*	*Males*	*Females*	*Males*	*Females*	*Males*	*Females*
Enrollment characteristics										
Gap_time	–0.132***	–0.054**	–0.132***	–0.054**	–0.132***	–0.054**	–0.132***	–0.054**	–0.132***	–0.054*
	(0.025)	(0.022)	(0.030)	(0.023)	(0.032)	(0.024)	(0.028)	(0.025)	(0.027)	(0.028)
Part_time	0.292***	0.219***	0.292***	0.219***	0.292***	0.219***	0.292***	0.219***	0.292***	0.219***
	(0.045)	(0.052)	(0.049)	(0.050)	(0.053)	(0.048)	(0.047)	(0.054)	(0.041)	(0.0565)
Year and faculties fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of obs.	26080	30727	26080	30727	26080	30727	26080	30727	26080	30727
Wald $\chi^2(29)$	3608.24	3152.93	1883.43	1903.62	3242.34	2116.77	2058.20	1786.48	2787.72	2628.37
Prob > χ^2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Log-likelihood	–15939.01	–18408.38	–15939.01	–18408.38	–15939.01	–18408.38	–15939.01	–18408.38	–15939.01	–18408.38
Pseudo R^2	0.1171	0.0875	0.1171	0.0875	0.1171	0.0875	0.1171	0.0875	0.1171	0.0875

(1) Standard errors robust to heteroskedasticity; (2) standard errors clustered faculty and year; (3) standard errors clustered faculty and year bootstrap (1000 replications); (4) standard errors clustered curricula and year; (5) standard errors clustered curricula and year bootstrap (1000 replications)

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

and workload among university teachers and researchers. Curricula are the smallest organizational units within the faculty and might be effectively the main place where common shocks may occur. The asymptotic approximation relevant for clustered standard errors relies on a large number of clusters (see Donald and Lang 2007). However, as a matter of robustness, non-parametric standard errors clustered at faculty, curriculum and year level based on a block bootstrap with 1000 replications (see Cameron *et al*. 2008) have been reported. Non-parametric standard errors are reported in columns 3 and 5.

With regard to individual characteristics, male students are found to be more likely to drop out than female students. Age is also significant and positively correlated to dropout; more specifically, dropout has an inverse U-shaped relationship with age.[23] Students whose residence is far from the university are less likely to withdraw; dropout has in this case a U-shaped relationship with residence.[24] In other words, the increase in age and residence does not lead to a linear change in the dropout probability. Turning to the pre-enrollment experiences, in line with the main literature, results show that educational background is an important determinant of the dropout decision. Relative to those who have completed scientific lyceum schooling, other things equal, having completed technical or professional secondary school increases the probability of dropout. Furthermore, high school diploma score is important. The higher the diploma score, the less likely students drop out from the university. Staying with pre-enrollment characteristics, those who enroll in the university immediately after obtaining a high school diploma have a lower probability of dropout. The enrollment specification plays a role, too, as being a part-time student increases the probability of dropout. Regarding students' financial conditions (specifically, family declared income), those students with a medium declared income[25] are less likely to drop out than those students with a low declared income. Results by gender are reported in Table 4.3.

Conclusions and discussion

This chapter examines the determinants of university dropout between the first and the second year, using a sample of 56,807 first-year students from a large Italian university based in the South of Italy, from academic year 2002–3 to academic year 2010–11. Understanding of the decision to withdraw has become a very important element of discussions in the higher education environment and might have important policy implications in the particular context of the post-reform tertiary education system in Italy. Indeed, according to Cappellari and Lucifora (2009), the "system was often criticized for its inefficiencies in terms of low enrollment, high drop-out, excessive actual length of studies". Moreover, higher education institutions are evaluated and then financially supported also on the basis of parameters and indicators, such as the dropout rate, especially between the first and the second year.

The empirical evidence (estimates are robust to different structures of the error terms) suggests that educational background and pre-enrollment characteristics have an important role in the decision to leave university. Having attended a vocational secondary education institution increases the student's attrition, and the higher is the diploma score the lower is the probability of dropout. According to the results obtained, well-trained students seem to be better integrated into the university system and there is a strong relationship between secondary school choice and parental background (educational, cultural and financial) to be taken into account. Secondary school track chosen also represents a channel through which the family environment (consolidating the intergenerational correlation in the educational attainment) influences the level of education completed (Checchi *et al*. 2013; Carneiro and Heckman 2005). Still in line with the main literature, evidence has been found that female, younger and full-time students and those who enrolled immediately after having attended high school are less likely to drop out. Regarding family socio-economic status (income), instead, estimates show that those students with a medium declared income are less likely to drop out between the first and second year. This result should be interpreted with care, mostly because a good measure of family income was lacking. Moreover, the family income variable may suffer from a partial correlation either with students' educational background or with their parents' level of education. It is also interesting to note that students whose residence is far from the university are less likely to withdraw. Student motivation probably plays an important role in this scenario; indeed, students whose residence is far from campus might have a higher incentive to finish university as they face (both financially and psychologically) high fixed costs (i.e. transportation and rent) in travelling to the university almost every day or transferring in a new city (where the university is located). The interpretation of this result must also be considered with caution as it is not possible, according to the data used in the analysis, to make a clear distinction (among those whose residence is far from campus) between those who travel daily to reach the university and those who do not travel. The allocation of scholarships (i.e. accommodation next to the campus) cannot be taken into account either.

The analysis may suffer from some limitations. There is a potential concern with regard to the external validity of the results, suggesting caution in the policy implications. However, although the findings are based on a single institution, it is plausible to believe that the evidence provided would hold for a similar environment and a similar local reference market in Italy. University regulators might take advantage of these studies through appropriate policy decisions in order to make the higher education system more efficient.

Finally, some policy implications and considerations. In spite of the limits due to data constraints (parents' education cannot be taken into account), if dropout is due more to personal factors (family background and pre-enrollment individual characteristics) than to a real scarcity of education supplied, then evaluating universities on indicators such as the number of students who persist between the first and the second year might not guarantee objectivity in assessing university quality. With regard further research, a more representative (i.e. more faculties and universities) and detailed (i.e. parents' education) dataset should be used.

Acknowledgements

Previous versions of this paper have been presented at Almalaurea Conference in Naples, Italy (2012) and University of Salerno, Italy (2012; 2013). I thank all conference and seminar participants. I also thank Marcello D'Amato and Vincenzo Carrieri for their support, useful comments and suggestions, and an anonymous referee for valuable comments. This notwithstanding, the author is solely responsible for the opinions expressed in this chapter.

Notes

1 See Angrist and Krueger (1991), Oreopoulos (2007), and Acemoglu and Angrist (2001) for compulsory school; see Blundell *et al*. (2003), Kane and Rouse (1993), Card (1995), and Conneely and Uusitalo (1997) for higher education. See Card (2001) for a survey on the econometric problems in estimating the return to schooling.
2 On average across OECD countries almost 84 percent of the population with a tertiary education qualification successfully entered the labor market in 2009.
3 The unemployment rate of those with a university degree has been around (or below) 4.4 percent and lower than those who have graduated high school (6.8 percent) and those who have obtained a qualification lower than secondary school (11.5 percent), among OECD countries in 2009.
4 The proportion of individuals with a full-time contract among those with tertiary education level is 10 percent higher than those with a secondary education qualification.
5 Individuals with tertiary education earn over 50 percent more than those with secondary education in 17 of the 32 countries surveyed (approximately 50 percent for Italy, about 60 percent in the United Kingdom and about 80 percent in the United States), taking the year 2009 or the last available year.
6 On average 31 percent of students entering tertiary education leave without at least a first degree among the 18 OECD countries for which data are available in 2008, and even though dropping out does not always represent a failure of individuals or inefficiency of universities, a high dropout rate shows that the higher education system probably did not match students' expectations and needs (OECD 2010).
7 Specifically, among the different parameters the Ministry has been using in the evaluation of the educational process, there is the share of students who drop out at the end of the first year, considering the number of students enrolled in the first year in the academic year $t/t+1$ who do not enroll in the second year in the academic year $t+1/t+2$ (Osservatorio 1998), the percentage of students who drop out between the first and the second year, also considering the number of entrance students who did not pass any exam in the first year (CNVSU 2001; Ministerial Decree 27 July 2000, no. 340; Ministerial Decree 23 April 2001, no. 96; Ministerial Decree 24 April 2002, no. 67), the share of students who enrolled in the second year in the academic year t having already obtained at least 50 credits in the academic year $t-1$ on the number on the entrance students in the academic year $t-1$ (Ministerial Decree 18 October 2007, no. 506; CNVSU 2009) and in general the dropout rate between the first and the second year (Ministerial Decree 31 October 2007, 544; CNVSU 2007).
8 See, among others, Boero *et al*. (2005) and Belloc *et al*. (2010).
9 Temporary dropouts are those students who withdraw during their first year and actually return to the same or some other institution of higher education shortly thereafter. Permanent dropouts are those students who definitively leave the higher education system.
10 See Belloc *et al*. (2010), where students transferring to another university are considered also dropouts.

11 Either a student is socially integrated into the university system but drops out (probably forcibly) due to lack of integration into the academic system (low grades) or, on the other hand, a student who gets good grades, and so is well integrated into the academic system, decides to drop out (probably voluntarily) for lack of integration in the academic system. Depending on motivation and academic ability and on interaction with the social characteristics of the university, the individual decides whether to stay on or drop out from university.

12 The probability of being employed might depend on the quality of matching between workers and firms.

13 In order to measure university quality (and therefore obtain quality categories), Light and Strayer (2000) use a measure of college selectivity; in other words, they use the median Scholastic Aptitude Test (SAT) of freshmen (i.e. student entering the university) and then form four quality categories based on the quartiles of this distribution.

14 In order to measure the quality of institutions, Johnes and McNabb (2004) use data on income and expenditure patterns of the universities and on staff–student ratios. Moreover, they measure teaching quality through subject-specific teaching quality assessments. They also take quality of research into account. See also James *et al*. (1989) on the relationship between school quality and future earnings, and Card and Krueger (1992) on the characteristics of US public schools and the returns to education.

15 The influence of external factors on student attitudes, on enrollment and dropout decisions has also been taken into account. Not differently from the turnover in work organizations, organizational, personal and environmental variables are important predictors of student persistence in higher education institutions.

16 Both Cingano and Cipollone (2007) and D'Hombres (2007) specifically find that the higher is the father's level of education, the lower is the probability of dropout.

17 They have found evidence that individuals with more educated parents have a higher probability of enrolling in the university after the "3+2" reform (see Chapter 5, this volume) and, conditional on it, they have a lower probability of dropout.

18 Belloc *et al*. (2010) found the opposite result. Students from an academically oriented secondary school (lyceum) and students with a higher diploma score are more likely to drop out. The evidence that students with a better educational background are more likely to drop out is explained, according to the authors, by the fact that more educated individuals prefer to change faculty or leave the university if they are not happy with the choice made or if their performance at university has been poor.

19 Data are related to students enrolled in the first level of study lasting 3 years which leads to the award of a university degree (*laurea*).

20 Concerning the residence variable, the main literature usually refers to the student's residence in the city, province or region where the university is located. Given the geographical peculiarity of the province of Salerno relative to the other provinces of Campania and given the geographical position of the University of Salerno (the campus is located approximately 15 kilometres from the city of Salerno), the residence variable measures, for each student, the distance in kilometres of the student's residence from the university location. In order to calculate that distance Google Maps has been used. Specifically, the distance is considered as the best and fastest way, suggested by Google Maps, to reach the university campus.

21 Concerning the family income variable, a good measure of family income was lacking. A measurement of the student's household economic situation (ISEE), which takes into account the household income, personal estate and number of members has been used as a proxy for income, although it might not accurately reflect the real level of the family income. University fees are paid by students according to their ISEE.

22 y^*_{ij} denotes registration not renewed.

23 The estimates show a positive and statistically significant relationship between dropout and age, while a negative and statistically significant relationship between dropout and

squared age has been found. At low values of age, being older has a positive effect on dropout (i.e. students drop out with higher probability as age increases). At some point, the effect becomes negative, and the quadratic shape means that the probability of leaving university with respect to the measure of age decreases as age increases (i.e. students have a lower probability of dropout after a certain age).

24 The estimates show a negative and statistically significant relationship between dropout and residence, while a positive and statistically significant relationship between dropout and squared residence has been found. In other words, at low values of residence, being far from the university campus has a negative effect on dropout (i.e. students drop out with lower probability as residence increases). At some point, the effect becomes positive, and the quadratic shape means that the probability of leaving the university with respect to the measure of residence increases as the distance from the campus increases (i.e. students have a higher probability of dropout above a certain distance).

25 Specifically between €12,000.01 and €32,000.00.

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5 University dropout rates in Italy

Lara Gitto, Leo Fulvio Minervini and Luisa Monaco

Introduction

High university dropout rates in Italy have been a widely observed and documented phenomenon for many years. Compared to their OECD counterparts, a large number of Italian students leave university before completing their degree courses, and significant numbers of dropouts occur during the first year of study. Only about one third of students who enrol get a university degree. Moreover, Italian students who graduate tend, on average, to be slower than other OECD students in completing their degree courses (Aina *et al*. 2011; for recent reports, see, for instance, MIUR 2011; Regini 2009).[1]

From this perspective, the fact that in Italy a high dropout rate has been observed, especially for first-year students, is considered to be a weakness of the Italian higher education system which policy-makers should take into account.

The issue of university dropout rates has been on the agenda of the Italian government. However, even after the 2000–1 reform, which was aimed at improving the situation of the Italian university system in international comparative terms, dropout rates have not changed substantially (Bratti *et al*. 2008; Cappellari and Lucifora 2009). Furthermore, the Ministry of Education, University and Research (MIUR) closely relates the evaluation of the Italian universities, and their ensuing financial incentives, to the dropout phenomenon: in fact, part of the funding of Italian universities is distributed according to a series of parameters, which include the number of students who drop out.

A large body of international literature exists on dropout issues; for instance, Mackie (2001), Smith and Naylor (2001), Bennett (2003), Harrison (2006) and the UK National Audit Office (2007) present analyses of dropouts from Anglo-Saxon universities. Nonetheless, research on dropouts from Italian universities is still limited. Most papers take a broad look at the performance of Italian students and suggest reasons for good or bad performance (e.g., Bratti *et al*. 2008; Checchi 2000), while studies on the specific issue of Italian dropouts are sometimes confined to local research carried out occasionally with regard to one or two universities (and selected faculties).

The aim of this study is to investigate university dropout in Italy, taking a broader perspective. The study considers all Italian universities, excluding only distance learning institutions.[2] Moreover, the proposed analysis of university dropout looks at two key research dimensions: university individual characteristics (e.g., number of degree courses and decentralized teaching branches) and student individual characteristics (e.g., performance in previous stages of education and school background).

The crucial hypothesis that this work intends to test is whether first-year student dropouts are due to characteristics of the organizational structures of degree courses in individual universities (university dimension), rather than characteristics of the student population only (student population dimension). Therefore, this study evolves along two dimensions, whereas existing research on dropout has neglected the former.[3] The novelty of the analysis is to assess both university and student characteristics.

The results may reveal, for instance, that the dropout phenomenon is more closely related to university characteristics than to student characteristics. In this case, a different organization of university courses (with less fragmentation and fewer remote university branches) might have a positive impact on student performance and reduce dropout. Alternatively, it may be found that students' characteristics provide a better explanation for the dropout issue. In this case, universities might implement, for instance, better selection procedures to discourage potential entrants who would be likely to abandon their studies, as well as to sustain motivated students who are skilled enough to succeed in their courses.

The rest of this paper is organized as follows. We begin with a short literature review of contributions on dropout rates, focusing on recent developments in Italian universities. This is followed by an overview of the Italian university system, highlighting some key changes that have occurred in recent years. We then move on to econometric analyses and illustrate the results obtained. The chapter concludes by providing policy suggestions.

Literature review

University dropout rates have been exciting researchers' interest for years. This has produced many analyses of university dropout, which have taken a number of directions. One approach has been to consider high dropout rates as a socially undesirable phenomenon which should be avoided.[4] However, some studies have questioned whether low dropout rates are socially desirable. Montmarquette *et al.* (2001) provide an overview of studies on this issue; they mention research contributions that suggest lowering dropout levels would not necessarily make society better off. Indeed, a few authors state that public policies should not try to influence dropout rates, as trying to reduce the number of university students who do not complete their degree courses might reduce social welfare. For instance, students may rationally choose not to complete their studies in a number of circumstances: firstly, when they see better opportunities in the job market (Di Pietro 2006); and secondly, after revising their prior beliefs about the education process

(Montmarquette *et al*. 2001; Belloc *et al*. 2010). Moreover, it can be argued that the lower the amount of university education costs borne by students, the lower is their private cost of dropout; thus, social costs of dropout are likely to be higher (e.g., lower human capital), especially when dropouts occur in state funded universities (Cappellari and Lucifora 2009).

The relatively high level of dropout rates calculated for Italian university students, especially in comparisons with students in other OECD countries (see, for instance, OECD 2009, 2010), is brought forward in various contributions (briefly discussed below), which more closely share our concern. Those contributions may be grouped with regard to two different approaches chosen for analysis. The first approach considers dropout rates across the entire Italian university system and, in defining the scope of the analysis, focuses on a relatively small group of variables, usually related to students' personal characteristics. The second approach considers case studies of particular Italian universities; those studies are quite often motivated by the internal information requirements of a single university.

Studies taking the first approach include Di Pietro and Cutillo (2008), who examine the impact on students' behaviour of various policy measures, introduced in recent years, relating to duration, structure and content of degree courses offered by Italian universities. Those measures have been widely debated, especially after 2001, when Italian degree courses were fundamentally reformed by the introduction of the so-called '3+2' structure, which offers students a university degree after 3 years of study, with the option to take a two-year postgraduate course afterwards.

The conclusions reached by Di Pietro and Cutillo (2008) highlight the fact that the 2001 reforms have had a positive impact on dropout rates. Similar results are obtained by D'Hombres (2007), who includes the motivational impact of the reform on student behaviour: as a university degree can be obtained after a relatively shorter period than in the past, students would be more prone to complete their courses and graduate.

Cingano and Cipollone (2007) combine individual- and aggregate-level data on student educational attainment. They use data from a representative sample of secondary school graduates and local supply of university courses to show that family and educational background are relevant determinants of continuation probability.

A study by Becker (2001) points to a comparison between dropout rates in Germany and Italy in a univariate decisional framework. The author argues that Italian students who abandon university can be separated into two major groups: students who have not chosen the most suitable university degree course (according to student characteristics); and students who have enrolled in a university course only because they have not received a suitable job offer.[5]

Published research concerned with dropout rates in individual Italian universities are quite limited. Belloc *et al.* (2010) studied university dropout in Italy by using data from the Faculty of Economics at the University 'La Sapienza' in Rome. Their results show that high dropout probability is related to high secondary school graduation marks and low performance at university, suggesting that the students who drop out are either unsuited to, or dissatisfied with, their chosen course. Moreover, the authors find that student characteristics, such as nationality and income, have a statistically significant impact on dropout rates.

A study by Schizzerotto (2003) analyses dropouts from the University of Milano Bicocca. Results highlight factors which have a bearing on dropout probability more than others; the author finds that crucial factors are the age of students at the time of enrolment, type of secondary school diploma and graduation marks (see also Boero *et al.* 2005, whose study relates to the University of Cagliari and the Tuscia University), as well as distance between the university and the student's home. The study also shows that dropout probabilities are different across different faculties (as in Ugolini 2000); moreover, dropout probabilities show a decrease after academic year 2001–2.[6]

Finally, Bratti *et al*. (2010) look at the case of the Faculty of Economics of the University Politecnica of Marche. Their results show that students' performances improved after 2001; however, they point out that the 2001 reform has also brought about a reduction in the effort required from students to complete their degree courses, with an indirect effect on the quality.

The Italian university system

The Italian university system has gone through a number of legislative and regulatory changes in recent years, especially following the 'Bologna process', which aimed at the development of an integrated and coherent European higher education sector (Cappellari and Lucifora 2009). Therefore, the Italian system was partially reshaped. The existing system consists of a greater number of public and private universities than in the past, as well as new distance learning universities. Moreover, for many years, legislation paved the way to a proliferation of decentralized structures (i.e., university branches) mostly devoted to teaching activities rather than research.

The most relevant change was the creation of new types of degrees courses, rearranged in a two-tier system with a three-year degree (undergraduate level) and an additional two-year degree (master's level). Among the motivations behind this change in the traditional system, which was based on a single four- or five-year degree, were the encouragement of university enrolment and the reduction of dropout rates and of time required to get a university degree. Under the reformed system, students can get their first-level university degree in fewer years and decide whether to keep on studying for another 2 years at a later stage. Nevertheless, research on the impact of such reform suggests that it has had a significantly positive impact only on the probability of enrolment, but not on the probability of obtaining a university degree (Bratti *et al*. 2008; MIUR 2011).

The rest of this section provides a sketch of recent developments in the Italian university system.[7]

Courses can be grouped into standard degree courses, which have a duration closer to traditional university degrees – usually 5 years – and 'short' three-year-degree courses; however, students are allowed to successfully complete their courses earlier, provided that they get the necessary amount of university learning credits (CFU) established for their degree.

The first group of degree courses includes *corsi di laurea quadriennale* (CDL, a four-year degree course), *scuole di specializzazione* (LSCU, courses that prepare for specific professions), *corsi di laurea specialistica* (LS, usually a two-year degree course requiring a three-year degree) and *corsi di laurea magistrale* (LMG, a five-year degree course).

The second group includes *corsi di diploma universitario* (CDU, which end up in a university diploma) and *scuole dirette a fini speciali* (SDFS, which are similar to LSCU, but at a lower educational level).

In the years immediately after the 2001–2 university reform, the number of ‘short’ degree courses increased significantly. However, it then stabilized, and has been paralleled by a slow but steady increase in the number of standard degree courses. Quantitative data on degree courses offered by Italian universities is shown in Figure 5.1.[8]

The number of degree courses taught in decentralized university remote campuses has grown disproportionately compared to the number of decentralized remote campuses itself. Over the same period, numbers of permanent teaching staff increased substantially; the number of assistant professors increased after 2002, whereas the numbers of full and associate professors have slightly declined since 2004–5.

In recent years, universities have also implemented Law no. 240/2010, the so-called ‘Gelmini reform’, which introduced major changes in university governance. In particular, university departments are currently in charge of research as well as teaching activities.

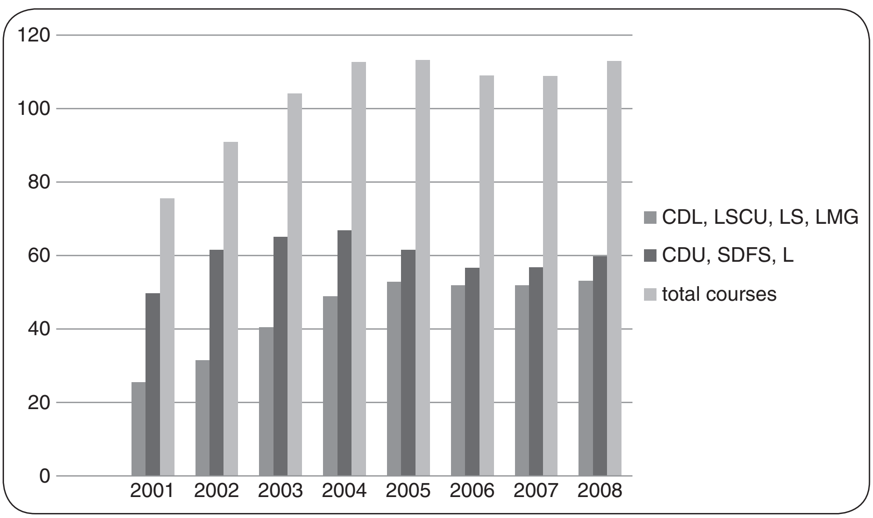

Figure 5.1 Number of university degree courses

Source: authors’ calculations based on MIUR data.

Finally, we note that, in the time span covered by our research, teaching activities were governed by faculties, so that the data we employed refers to faculties.

Methodology and results

This analysis is focused on university student dropout rates. When it is not determined by students' personal motivations, this phenomenon might signal a general dissatisfaction with courses and tuition offered by universities (Becker 2001; Belloc *et al.* 2010), so that action might be required to improve them.

Universities constitute the observed units. The estimation strategy initially selected was a fixed effects (FE) model, in order to isolate the characteristics of each university. An error term is included in the regression equation and is assumed to be constant over time (Hsiao 1986; Arellano 2003; Allison 2009). The model specification is

$$Y_{ij} = (\alpha + \delta_i) + X_{ij}\beta + \varepsilon_{it}.$$

The deterministic part of the equation is compounded by the constant term and an element δ varying for each unit i. δ_i can be interpreted as 'university effect' (i.e., the unobserved individual factors), and ε_{it} is the residual term. The estimator was obtained by applying ordinary least squares to a transformed model, which takes into account mean deviation.[9]

The regression coefficients and the university effect can be interpreted as policy-relevant effects with further assumptions: $\varepsilon_{ij} \sim$ i.i.d. $N(0,\sigma_e^2)$, meaning that the error terms are independently and identically normally distributed with mean 0 and variance σ^2; and exogeneity of the covariates x_{ij}, e.g. $\operatorname{cov}\left(e_{ij}, x_{kij}\right) = 0$ for $k = 1,\ldots, p$.

In the FE model, no assumptions are made about the error term, so that the university effects are treated as nuisance.[10] The FE model does not consider variability across individuals ('within' transformations) and between individuals, because individual time-invariant components y_i and x_i are removed by each observation. Instead, the generalized least squares (GLS) estimator in a model with random effects uses information on both within and between variability. We can assume the presence of heteroscedasticity as well as autocorrelation in the panel data. In this case the GLS estimator

$$\beta^{\mathrm{GLS}} = \left(X'\Omega^{-1}X\right)^{-1} X'\Omega^{-1}Y$$

can be employed.

The dataset used in the analysis was built with MIUR[11] and ISTAT[12] data, relating to 76 Italian universities and with the exclusion of distance learning universities. The observation period, for each university, is the time span between the implementation of the 2001 reform (which introduced the '3 + 2' degree courses) and the academic year 2007–8. The panel is unbalanced: while for most

Table 5.1 Italian universities: descriptive statistics

Variable	*Obs.*	*Mean*	*Std. Dev.*	*Min*	*Max*
Publicly/privately owned universities	537	0.86	0.34	0	1
University and type of courses					
Number of university remote campuses	465	4.11	4.6	0	27
Number of sites in the same province	464	0.57	0.49	0	1
Number of sites outside the province	464	0.66	0.48	0	1
Three-year courses	464	50.06	42.95	1	257
Three-year courses including university diploma and SDFS	467	65.53	56.46	1	313
Total number of courses (including four-year courses)	466	117.07	98.98	1	552
Courses taught in university remote campuses	506	22.06	32.58	0	211
Three-year courses/total courses	463	0.44	0.11	.2	1
Doctoral courses	278	209.12	201.96	3	1053
Doctoral courses with scholarships	278	113.90	111.14	2	560
Teaching staff					
Full professors	521	256.45	271.61	1	1471
Associate professors	522	251.97	254.54	1	1360
Assistant professors	513	309.86	342.32	1	2065
Overall teaching staff	513	825.63	862.25	5	4817
Number of no credits students					
Number of new enrolled students with no credits	531	0.17	0.11	0.001	1.007
Number of Architecture/Engineering students with no credits	352	0.15	0.12	0	1.01
Number of Economics/Statistics/Political sciences students with no credits	470	0.17	0.13	0	1.59
Number of Chemistry/Physics/Science students with no credits	312	0.20	0.13	0	1
Number of Literature/Linguistics/Educational sciences students with no credits	415	0.16	0.12	0	1.01
Number of Medicine students with no credits	273	0.072	0.09	0	1
New enrolled students' high school					
Architecture/Engineering students from lyceums	352	452.73	640	0	3773
Architecture/Engineering students from other high schools	352	19.70	41.85	0	410
Chemistry/Physics/Science students from professional/technical high schools	312	158.27	145.67	0	708
Chemistry/Physics/Science students from lyceums	312	171.96	164.09	0	887
Chemistry/Physics/Science students from other high schools	312	5.84	7.67	0	47
Literature/Foreign lang./Education students from professional/technical high schools	541	256.56	361.94	0	2518

(*Continued*)

Table 5.1 (Continued)

Variable	*Obs.*	*Mean*	*Std. Dev.*	*Min*	*Max*
Literature/Foreign lang./Education students from lyceums	541	416.81	577.5	0	2935
Literature/Foreign lang./Education students from other high schools	541	16.5	27.43	0	147
Economics/Statistics/Political sciences students from professional/technical high schools	540	509.47	546.96	0	3793
Economics/Statistics/Political sciences students from lyceums	540	466.19	526.9	0	3254
Economics/Statistics/Political sciences students from other high schools	540	27.71	44.48	0	270
Medicine students from professional/ technical high schools	273	286.22	294.02	2	2492
Medicine students from lyceums	273	245.79	200.36	5	1232
Medicine students from other high schools	273	15.51	18.23	0	137
New enrolled students' diploma grade					
Architecture/Engineering students with diploma grade 90–100	366	299.51	394.87	0	2328
Economics/Statistics/Political sciences students with diploma grade 90–100	482	283.15	269.44	0	1543
Chemistry/Physics/Science students with diploma grade 90–100	335	89.62	83.30	0	335
Literature/Foreign lang./Education students with diploma grade 90–100	428	229.24	245.65	0	1219
Medicine students with diploma grade 90–100 males	273	16.9	18.84	0	137
Medicine students with diploma grade 90–100 females	273	71.14	48.04	0	245

universities there are seven observations, for some universities (e.g., Bolzano, Cagliari, Catanzaro), which have implemented the reform since academic year 2001–2, there are eight. Descriptive statistics are presented in Table 5.1.

The dependent variable in the estimations is the number of newly enrolled students who did not obtain credits out of the total number of students enrolled at the first year.[13] Regressors relate to university characteristics such as number of university remote campuses, university remote campus location (inside or outside the province where the core teaching site is located), type of courses offered over the total courses (three-years degrees versus university diplomas), and student background (high school attended and final grade). Results of FE and GLS models, the latter with either heteroscedasticity or panel-specific autocorrelation, are reported in Table 5.2.

The FE model does not show significant coefficients, except for the number of remote campuses and their location within the same province where the main university site is located. The signs of the estimated coefficients are confirmed by the GLS regressions.

Table 5.2 Estimation results

Dependent variable: quota newly enrolled students with no credits	*Fixed effects*	*GLS with heteroscedasticity*	*GLS with panel-specific autocorrelation*
Three-year degree courses/total number of courses	0.212 (0.352)	0.165 (0.125)	0.270*** (0.078)
Average course at university remote campuses	–0.014 (0.011)	–0.005*** (0.001)	–0.008*** (0.002)
Number of university remote campuses	0.052*** (0.015)	0.0002 (0.002)	0.0001 (0.001)
Remote campuses in the same province	–0.154** (0.065)	–0.054*** (0.016)	–0.071*** (0.014)
Number of students grade 90–100	–0.572 (0.721)	–0.298* (0.182)	–0.217* (0.131)
Number of students from lyceums	0.227 (0.348)	0.486*** (0.125)	0.544*** (0.087)
Number of students from profess./ technical schools	0.184 (0.290)	–0.043 (0.102)	–0.110* (0.065)
Lecturers/students	0.378 (0.397)	–0.555*** (0.079)	–0.560*** (0.068)
PhD with scholarship/ total number PhD	–0.455 (0.305	–0.074 (0.074)	–0.164*** (0.054)
Constant	0.247 (0.341)	0.257** (0.119)	0.275*** (0.059)
	F-test = 2.12 Prob > F = 0.041 σ^2 u = 0.2103; σ^2 e = 0.086; ρ = 0.8491 F-test all u_i = 0: 2.84 Prob > F = 0.0008	Wald χ^2 = 61.45 Prob > χ^2 = 0.000	Wald χ^2 = 142.67 Prob > χ^2 = 0.000

*** significant at 1%; ** significant at 5%; *significant at 10%

The number of three-year degree courses out of the total number of courses offered by the university (university diplomas, special schools, etc.) is positively correlated with the share of students who did not get any credit; in other words, the higher the number of three-year degree courses, the higher the number of new enrolled students who do not obtain credits. This conclusion might be interpreted as an excessive fragmentation of courses and should be verified by examining the share of students who decide to move to a similar course after the first year.

The results relating to remote campuses are interesting and allow us to draw some policy implications. We considered among the regressors the average number of courses taught at remote campuses, their number for each observed unit and their location within the same province. Results suggest that the higher the number of remote campuses (i.e., a highly fragmented supply), the higher the share of dropouts.[14] But when remote campuses are located within the same province and offer many courses, the percentage of students who do not get credits is likely to be lower.

One of the objectives of the reform was to increase supply by allowing universities to establish decentralized remote campuses, so as to introduce enrolment incentives for students who do not live close to main university sites. However, what was observed was a relocation of students, while the number of students per university did not change significantly.[15]

The effect due to the location of university remote campuses within the same province implies how the establishment of peripheral sites, close to the main branch, allows for a better control and organization of courses, whereas such monitoring might not be possible when the peripheral site is located outside the province or even in another region.

Other supply variables relate to teaching staff (number of lecturers/number of new enrolled students) and postgraduate programmes (PhD courses with scholarships). Both are significant and inversely correlated with dropouts. A higher lecturer–student ratio is, therefore, seen as a quality indicator. The prospect of starting a PhD course could be seen as an incentive for students to proceed with their courses without dropping out, although this evidence should be confirmed by the percentage of graduated students who apply for a PhD after graduation.

Information about students' background should verify the positive correlation between a good performance at school and university results. Moreover, while a grammar school (e.g., a lyceum) is usually expected to provide a strong background for further academic studies, a professional/technical school should have work and practical skill orientations. A positive correlation between university dropouts and number of students coming from professional/technical schools should confirm this hypothesis.

Similarly, the diploma grade should corroborate the intuitive proposition that students who did well at high school are likely to succeed at university. While this second hypothesis is confirmed by results, so that students who obtained diploma grades between 90 and 100 (the highest) achieved credits during their first year at university, the share of students who attended a lyceum is positively correlated with inactivity at university. This result might signal a general worsening of the education level reached by students when they enrol at the university. Although this evidence is in an opposite direction from that in the main literature (see, for example, Di Pietro and Cutillo 2008; Aina *et al.* 2011; Cingano and Cipollone 2007; Boero *et al.* 2005), a possible explanation might be that more and better educated students prefer to change faculty when they are not satisfied with the organization of the degree course or with their marks (Belloc *et al.* 2010).

Looking at the magnitude of estimated coefficients, it seems that variables related to demand (students' background) impact more on dropout of newly enrolled students' than those variables related to educational supply. However, when analysing the phenomenon of dropout, variables related to supply need to be taken into account as well.

Concluding remarks

The aim of this research was to study whether factors related to supply of university education (the 'university dimension') might have an impact in determining dropout, thus broadening the analysis of university dropout rates beyond the more traditional research focusing on demand-related factors (the 'student dimension').

In a nutshell, our study suggests that demand-side factors (i.e., students' characteristics such as their background) are relevant in explaining dropout at a general level. University-related factors do have a significant impact on the probability of dropout too, especially when considering the organization and activities of remote campuses.

A FE model has been applied to take into account characteristics of each university observed. Dropout rates seem to be influenced mainly by students' background (in line with the main findings in the existing literature); however, some supply factors, such as a high number of remote campuses and geographical fragmentation, also have an influence. Therefore, a less dispersed university organization, focused around a core unit, might offer a more attractive academic environment for students and help to reduce dropout rates.

Our results also suggest that the higher the number of three-year degree courses, the higher the number of new enrolled students who do not obtain credits. This is an interesting result, as one motivation behind the 'Bologna process' and the introduction of the three-year degree was to reduce the number of dropouts (as well as of freshmen who do not pass exams). This evidence might be interpreted as a failure of the '3 + 2' system (Di Pietro and Cutillo 2008; Cappellari and Lucifora 2009, Bratti *et al*. 2010) and calls into question other important issues about the consequences of universities' greater autonomy: it seems that the decision to expand the supply in terms of more courses may have a significantly positive impact only on the probability of university enrolment but not on that of obtaining a university degree.

Information about students' university fee payments (and possibly other major expenses) as well as opportunity costs might help to explain dropout. Indeed, students could opt to enter the labour market (Di Pietro 2006). With regard to the student dimension, it is likely that the presence of a nearby university remote campus may encourage some students to enrol, even though they would not enrol if universities were located far from their hometown. Those students might be less motivated and less able to gain university course credits. From this perspective, our study suggests additional factors that might have contributed to the reduction of students' private costs of university education in Italy – and had a bearing on students' enrolment decisions – but with poor impact on dropout (Bratti *et al*. 2008).

In line with the literature, we find that students who obtained diploma grades between 90 and 100 achieved credits during their first year at university. However, the share of students who attended lyceums is positively correlated with inactivity at university. This result is associated with Belloc *et al*. (2010), whose work also finds evidence that students who attended a lyceum (as well as students with a higher secondary school grade) have a higher probability of dropping out.

Yet it goes in an opposite direction to the main literature (Di Pietro and Cutillo 2008; Aina *et al*. 2011; Cingano and Cipollone 2007; Boero *et al*. 2005) and may deserve further investigation in the future.

Teaching staff (the ratio of lecturers to newly enrolled students) exert a negative impact on dropouts. Further analysis should consider indicators of teaching quality that might be identified in advance – for instance, looking at the criteria adopted by ANVUR and CIVR (two national agencies involved in the evaluation of universities and academic research). The role of temporary teaching staff, who usually work on a short-term contract basis, may be worth of further analysis.

Finally, future work could take into account also university financial resources as well as other macroeconomic variables such as employment prospects (see Aina *et al.* 2011).

Acknowledgements

We would like to thank participants and discussants at the seminar held at the Università di Catania, Department of Economics (March 2011), at the XXIII SIEP conference (September 2011), and at the 'Youth and their Future: Work, Education and Health' workshop (October 2013). We owe special thanks to Pier Luigi Belvisi, Eleonora Cutrini, Calogero Guccio, Mark Hagger, Aline Pennisi and an anonymous referee. Usual disclaimers apply.

Notes

1 A related issue is the high number of students who do not sit or pass exams in the first year.
2 These are different in nature and structure from the traditional ones; in addition, they have only a relatively short history (therefore, little data is available).
3 Aina *et al*. (2011) study time to degree for Italian university students. Although this is a different issue, their research approach is similar: they assess the impact of university inputs (i.e., university characteristics), labour market characteristics, and students' individual and family characteristics.
4 This is the approach that can be seen in the background of our introductory discussion.
5 In Germany, where the dropout rates are lower, only students of the first group could be found; moreover, the group is less numerous than in Italy (see Di Pietro 2006; Belloc *et al*. 2010).
6 Perotti (2008) criticizes the observation of lower dropout probabilities after 2001 and focuses on the phenomenon of 'quick graduates', that is, students who have switched to shorter degree courses after the 2001 reform. This artificially increases the number of students completing degree courses after 2001.
7 Readers familiar with the Italian framework may prefer to move on to the following section.
8 Data used in the present analysis is published by MIUR, available at http://www.miur.it.
9 As observed by Clarke *et al*. (2010), in performing hierarchical analyses, the fixed effects model is particularly well suited if the main interest is in a policy relevant inference analysis that considers individual characteristics, but with unclear data selection process. On the other hand, when information about the selection process is available (in this case, for example, the proportion of students with higher final marks at completion of higher school education and enrolling in certain universities/faculties, etc.), the random effects model should be selected.

10 Moreover, the estimates with the FE approach are not precisely weighted and can be very unreliable where n_j is small or the within-universities variance is large relative to between-universities variance. By making a comparison between fixed and random effects approaches, Wooldridge (2002) outlines how the two estimators are not equal, but in these cases can be very close.
11 http://statistica.miur.it/ustat/Statistiche/IU_home.asp.
12 http://www.istat.it/ambiente/contesto/infoterr/azioneB.html.
13 The National University System Evaluation Council (*Comitato Nazionale per la Valutazione del Sistema Universitario*, CNVSU) considers the phenomenon of dropout when referring to those first-year students who do not enrol in the second year. However, the number of students who did not obtain any credits is a good proxy for the students who drop out, if we assume that freshmen who do not sit or pass any exam during their first year will probably not enrol again in the second year.
14 The number of university remote campuses differs widely from one university to another (for instance, Università di Aosta, a small university, has no remote campuses; whereas Università Cattolica del Sacro Cuore has 27 remote campuses).
15 For instance, Università Cattolica del Sacro Cuore, in Milan, had 13 remote campuses and 7,262 newly enrolled students in the academic year 2001–2 (one year before the reform); in the academic year 2007–8, the number of remote campuses doubled, but the number of new enrolled students (8,385) increased less than proportionately.

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6 The future has early roots

Learning outcomes and school effectiveness in Tuscany's primary education system

Enrico Conti, Silvia Duranti, Carla Rampichini and Nicola Sciclone

Introduction

The educational system has a key role in influencing the future of young generations: indeed, it is school that provides the necessary skills and competences to successfully enter the labour market.

The increasing difficulties encountered by Italian young people in the transition to work (IRPET 2013) have stimulated studies on the role that the educational system can play in facilitating or hampering the entrance to the labour market. Such studies usually focus on upper secondary school or university levels (Ungaro and Verzicco 2005; Di Patrizio *et al*. 2009; Aina and Pastore 2012; Caroleo and Pastore 2012), mainly looking at the role that the type of education received (general or vocational) can play in the transition to work. But young people's destiny is decided well before secondary school: the choice of the type of secondary education (and of university) itself strongly depends on past attainment levels, which, in turn, are largely explained by family characteristics (Checchi and Flabbi 2007; Mocetti 2007; Giuliano 2008).

Thus, from the earliest years of education the school system can significantly influence pupils' future prospects. Primary school should indeed be able to guarantee all pupils, irrespective of their family background, at least a standard level of learning outcomes, thus providing them with the necessary tools to be successful both in upper school grades and, eventually, in the labour market. Acknowledging the key role played by primary school in influencing pupils' future prospects, in this chapter we intend to analyse the effectiveness of public primary schools in Tuscany.

In this chapter, effectiveness is measured in relative terms, comparing institutions offering the same service after having adjusted for factors outside their control (Raudenbusch and Willms 1995; Grilli and Rampichini 2009). The kind of adjustment required for assessing effectiveness depends on the type of effectiveness one wants to estimate; if the aim is to assess the 'production process' in order to evaluate the ability of the institution to exploit the available resources, then the school's performance needs to be adjusted for the features of its students, of the school itself and of the context in which it operates. Our analysis of school effectiveness is done by disentangling the role of individual, school and territorial characteristics in determining students' performance, with the main goal of identifying the relevance of 'school factors'. Such an analysis is possible thanks to the availability of data on scores of INVALSI reading and mathematics tests, now yearly administered on a census basis to the second and fifth classes of primary school (grades 2 and 5), the first and third classes of middle school (grades 6 and 8) and the second class of high school (grade 10).[1]

Our aim is to describe the main determinants of grade 5 pupils' outcomes, disentangling the role of individual characteristics (demographic, social, economic and cultural) from those of schools. Such factors may be usefully divided into two categories: externally determined factors (average characteristics of pupils who are attending the school, such as socio-economic status of pupils, nationality, but also quality and quantity of school resources, which in Italy are mainly managed by the Ministry of Education (MIUR)) and characteristics which are in principle controlled by the school itself. To this end, we adopt a multilevel regression model, which properly takes into account the hierarchical structure of data (pupils nested within schools) by partitioning the residual variance into pupils and school components. Using this kind of methodology, it is possible to obtain results that can be used for several purposes (Grilli and Rampichini 2009). The first is the study of the relationship between outcome and explanatory variables, which is a common aim of all statistical models; findings should be interpreted in terms of associations without giving them any causal interpretation, as the availability of a single cross-section of data prevents any attempt to identify causality, which requires more sophisticated techniques and data (Murnane and Willet 2011). A second purpose is to predict the outcome for a given student in a given school, in order to understand how a different context can change a student's potential performance. A third purpose is to rank schools according to their effectiveness, derived from school-level residuals. This is a useful tool to identify areas with anomalous performance.

Our chapter is innovative in this field of research in two aspects. First, it benefits from the construction of a new dataset, which combines data provided by INVALSI (test scores, individual characteristics and some information on schools) with data available on the MIUR website (containing information on school resources). The availability of school, class and pupil variables allows an innovative analysis with respect to the existing literature on the effectiveness of Italian schools. Indeed, we have direct measures of school resources, while existing work in this field of research has mainly been based on indirect measures, derived from information provided by school head teachers (Castellano *et al*. 2009; Benadusi *et al*. 2010; Agasisti and Vittadini 2012; Agasisti 2013). A second innovative aspect concerns the concentration on primary schools located in a single region, namely Tuscany; this avoids the substantial heterogeneity across regions highlighted in several Italian studies on the issue (Checchi 2004; Bratti *et al*. 2007; Montanaro 2008; Castellano *et al*. 2009; Benadusi *et al*. 2010; Agasisti and Vittadini 2012) and allows us to concentrate on variation across small geographical units, such as zonal conferences.[2] To date, little research has focused on territorial disparities other than the North–South divide; this is the case of the research conducted by Bratti *et al*. (2007), Benadusi *et al*. (2010), Ferrer-Esteban (2011) and Agasisti (2011) where, however, the benchmark for each school is set at the provincial level.

A literature review

This section briefly reviews the main determinants of students' performance, as highlighted in the literature in this field, distinguishing between the effects of four distinct subjects: family, classmates, school and community.

The family of origin influences a student's performance through a series of channels, such as the quantity and quality of time parents devote to the education of children, which can be proxied by the number of children, working habits, age, etc. Family economic circumstances also exert a direct influence on students' performance, as wealthier parents can invest more in the education of children (through extra activities, private lessons, etc.). Therefore, empirical analyses on the determinants of students' performance usually include among explanatory variables the family background, described through characteristics of the family structure (number of children, marital status of parents)[3] but above all through proxies of the family's social, cultural and economic capital. In particular, the main variables used concern direct measures of family background, such as income, education level and occupation of parents, or proxies, such as the number of books or bathrooms at home. Research in this field confirms the important role of family background in influencing students' performance, even if the magnitude of the effect differs across countries (Wößmann 2004). Student and family nationality can also have an impact on school results, exerting an effect independently of socio-economic status. Indeed, the children of immigrants may have a deficit in educational attainment due not only to lower family endowments but also to problems in integrating with classmates or to language difficulties, which tend to hamper their school performance (Schnepf 2007).

School plays an important role in determining students' performance. However, the literature in this field has focused on the amount of school resources (class size, student–teacher ratio, etc.) without finding any robust evidence of its effects on students' performance (Hanushek 1997). Although from a theoretical point of view one could expect a negative correlation between class size and school performance (smaller classes help to improve school climate and increase students' attention), empirical research has generally found a weak relationship between the two (Ehrenberg *et al*. 2001; Piketty and Valdenaire 2006; Minzyuk and Russo 2012; Wößmann and West 2006), which appears to be slightly stronger in the early years of schooling (Finn 1998). One reason for the lack of clear evidence may be the endogeneity of class size, often influenced by a non-random sorting of students into different classes; indeed, according to compensatory policies, weaker students tend to be allocated to smaller classes in order to ensure them greater support from teachers and a better climate (Minzyuk and Russo 2012; Boozer and Rouse 2001). As far as human resources are concerned, the literature reveals that it is more their quality than their quantity that determines differences in students' performance

(Hanushek 1997; Woβmann 2003). However, the analysis of the role of teacher quality on students' performance may be hampered by a non-random allocation of human resources to schools: teachers know which are the best schools and tend to (or at least seek to) move there when their level of seniority allows it (Barbieri *et al*. 2007). Also organizational factors may play a role in influencing students' performance; however, no clear evidence is found with regard either to school autonomy (Wöβmann 2003; Jürges and Schneider 2004) or to ownership structure (Fuchs and Woβmann 2007; Vandenberghe and Robin 2004).

Classmates have a direct influence on student performance through multiple channels, which in the literature are usually summarized as 'peer effects'. Peers provide the model to be followed and influence considerably the scale of values, but they also affect a student's behaviour through competition effects. In both cases, a higher average class quality should cause an improvement in an individual student's performance, even if the literature does not provide a clear evidence on this (Zimmer and Toma 2000; Hanushek *et al*. 2003; Hanushek 2003). One reason for this opacity could be the use of school-level variables to identify the peer-group effect (motivated by the lack of class-level data in most databases on student performance), even if the entire population of a school is clearly not a good proxy for the (class-level) peer group (Bratti *et al*. 2007).

Finally, the context in which a student lives contributes to his or her school performance; in particular, social cohesion, average cultural level and shared values can affect a student‘s aspirations and motivations for studying. This effect, usually called a 'neighbourhood effect' (Bratti *et al*. 2007), is usually proxied by a series of indicators on average incomes, educational levels and unemployment rates etc in the local community.

When looking at the literature on Italy, it should be noted that there has only recently been growing attention to the determinants of students' achievement, thanks to the availability of international (such as OECD-PISA) and INVALSI test scores.

Using OECD-PISA data, Checchi (2004) highlights the existence of regional disparities in 15-year-old students' performance in Italy, even after controlling for the type of secondary school attended and for individual background. The analysis shows that the main factors affecting student achievement are related to socio-economic status; however, average parental education and socio-economic status measured at the school level appear to be much stronger predictors than individual variables, thus indirectly confirming that environmental and peer factors may be important determinants of student performance.

OECD-PISA data are also employed by Bratti *et al*. (2007) to explain the determinants of 15-years-old students' achievement with several individual and school characteristics. Their results confirm the relevance of the socio-economic status, of the macro area and of the type of secondary school in determining student achievement; another significant result is that private schools perform worse than public ones.

Other contributions in this field employ multilevel modelling to explicitly take into account the hierarchical nature of data, thus providing a more robust analysis than previous ones on the determinants of student performance. Castellano *et al*. (2009) confirm the role of socio-economic factors in explaining inter-individual differences in test scores, finding little evidence of the effect exerted by school resources. A similar analysis carried out by Benadusi *et al*. (2010) points to the greater relevance of the average school socio-economic level than of the individual level in explaining student achievement, providing some evidence of the existence of forms of socio-cultural segregation among schools.

Another contribution to the literature is provided by Agasisti (2011), which also relies upon OECD-PISA data. The results are pretty similar to those obtained in the previously cited works, but the analysis includes a measure of competition among the covariates, to investigate whether competition actually fosters schools' performance (hypothesis partially confirmed by the empirical results). The theme of school competition is explored also using INVALSI data on lower secondary schools, obtaining similar results on the effects on pupil performance (Agasisti 2013).

INVALSI data are also used by Agasisti and Vittadini (2012), who carry out a multilevel analysis to decompose the overall variance of student achievement scores into three components: within-schools variance, between-schools variance and between-regions variance. The findings confirm that variance at the regional level is statistically significant (it accounts for 4.6 per cent of the total variance) and due to socio-economic structural differences among regions, as measured by GDP per capita.

To our knowledge, the only analysis on primary schools' effectiveness is that conducted by Grilli and Sani (2011) on INVALSI data. As in many of the studies cited above, the methodological approach is a multilevel model. The authors considered heteroscedastic variance components, thus allowing the pupil-level variance to change with gender and the school-level variance to change with geographical area. The estimates of the regression coefficients are in line with empirical analyses on different school grades: lower test scores are found for foreigners and pupils with a low economic, social and cultural background. Peer and contextual effects, very important in empirical analyses on secondary school, influence pupil performance in primary school too. However, the analysis cannot take into account school-level variables other than compositional ones (i.e., averages of the same variables inserted into the model at the first level); indeed, the data used do not include information on school characteristics and resources, such as the number of pupils per teacher or the availability of school facilities, thus hindering the analysis of the school effect.

Methodological approach

In this chapter, we use a multilevel approach to analyse school performance, taking into account the hierarchical structure of the data: pupils nested within schools.[4] Multilevel models are a good method for studying the relationship between outputs and contextual and organizational variables in complex hierarchical structures, considering both individual and aggregate levels of analysis. The use of multilevel modelling prevents some common errors in the interpretation of individual data nested within larger units, such as interpreting at the individual level some variables obtained by aggregating data at higher level and interpreting group effects by using individual-level data. Indeed, the multilevel regression analysis estimates a regression equation which takes into account the correlation of the responses of the pupils of the same school, thus obtaining more accurate estimates of the role played by different factors in determining pupils' outcomes (Goldstein 2003; de Leeuw and Meijer 2008).

Our estimation procedure follows four steps: in the first step, we estimate an 'empty' model, to decompose the total variance into the student-level (within) variance and school-level (between) variance, while in the second and third steps we add explanatory variables respectively at student and school level, and then in the last step we insert spatial dummies in order to check for spatial variability among test scores.

We estimate the following model for both mathematics and reading scores:

$$Y_{ij} = \alpha + \mathbf{b}'\mathbf{X}_{ij} + \mathbf{g}'\mathbf{W}_j + u_j + e_{ij}, \tag{6.1}$$

where Y_{ij} is the outcome of pupil i in class j (reading or maths), $i = 1,2, \ldots, n_j$, $j = 1,2,\ldots, J$, α is the intercept, $\mathbf{X}_{ij}$ is the vector of level 1 (pupil) covariates, including the spatial dummies, $\mathbf{W}_j$ is the vector of level-2 (school) covariates, **b** and **g** are the corresponding vectors of fixed parameters, u_j is the level-2 error and e_{ij} is the level 1 error. The model assumes independent and identically normally distributed errors, i.e. $u_j \sim \text{i.i.d. } N(0,\tau^2)$, $e_{ij} \sim \text{i.i.d. } N(0,\sigma^2)$, and $\text{cov}(u_j, e_{ij}) = 0$.

Data description

The database

The database on Tuscan public schools used in this chapter was obtained by merging the INVALSI dataset with other sources of information at the primary school level. The INVALSI dataset contains individual data on the 2010/11 test carried out on grade 5 pupils of both private and public schools. We selected the public schools, obtaining information on the maths test for 868 schools and on the reading test for 871 schools, which represent 92 per cent of Tuscan public schools. The test includes 61 multiple-choice items for reading and 47 for mathematics; test scores have been standardized to the range 0–100, representing the percentage of right answers. For each pupil, the dataset contains the maths and reading standardized score and individual characteristics: gender, age, nationality, the province where he/she lives and some variables on family characteristics.

The INVALSI dataset also contains information at the class level on the size and composition of the class: total number of pupils, number of foreign pupils, number of disabled and of repeating pupils.

The original dataset was matched at the school level with the administrative data available on the MIUR website on the financial, instructional and human resources employed by all public schools. For primary education, financial and human resources are available at the level of school institutions and have been attributed to single schools on the basis of the number of pupils. Information on the quality of school buildings, from the Tuscan Register of school buildings, was also merged to the main dataset.

The resulting database was also merged with variables concerning the geographical, social and economic context in which the school operates, collected at the municipal level. As INVALSI does not communicate information at school level, but only at the province level, INVALSI itself merged our municipality-based dataset with the main INVALSI dataset for us, removing school identifiers and then returning the output to us in the form of anonymized data.

The final database contains data for 25,720 pupils nested within 871 public schools.

In order to stabilize the sample from one step to another of the multilevel analysis, the database was 'cleaned' by removing all records with at least one covariate missing. Therefore, our final maths database comprises 23,406 pupils nested within 1,343 classes and 844 schools and the reading database includes 23,665 pupils nested within 1,369 classes and 848 schools.[5]

Relevant variables

The following pupil covariates are included in model (6.1):

- *Male*, a dummy taking value 1 if the pupil is male and 0 if female;
- *ESCS*, a proxy variable of socio-economical status, constructed by INVALSI through a principal component analysis of three indicators: employment status of pupil's parents, the level of education of pupil's parents and the possession of a range of specific goods.[6] The *ESCS* variable has been standardized with mean 0 and standard deviation 1 (Campodifiori *et al*. 2010);[7]
- *Foreign*, a dummy variable taking value 1 if the pupil is foreign and 0 otherwise;
- *Late*, a dummy variable taking value 1 if the pupil has a delay in the schooling career and 0 otherwise;
- *LateXforeign*, an interaction term, taking value 1 if the pupil is both foreign and late;
- *Full time*, a dummy variable taking value 1 if the pupil attends a full-time class (40 hours) and 0 otherwise.

To control for the learning environment into which the pupil is placed, we include a categorical variable for class size, taking value 1 if the number of pupils per class is less than 10, 2 if it is between 10 and 25, and 3 if it is higher than 25. We choose not to include compositional variables at the class level because the composition of classes might fall under the control of the head teacher, thus being part of the school's effectiveness. As our primary aim is not the identification of peer effects but rather the comparison of schools' effectiveness, we include compositional variables at the school level, in order to control for the catchment area of the school, on which the head teacher has no influence.

The school-level covariates we include in model (1) are both compositional variables, obtained as the average of pupil-level covariates, and variables measuring the resources employed in the education process:

- school average of pupil ESCS;
- percentage of grade 5 pupils who have a delay in their school career;
- size of the municipality where the school is located, expressed as the inverse of the municipality population;
- school building status, a continuous variable which ranges between 1 (if the building needs radical interventions in fixtures or structure) and 6 (if the building's status is optimal);[8]
- fixed-term teachers, a three-category ordinal variable taking value 1 if the incidence of fixed-term teachers over the total number of teachers in the school is lower than the 25th percentile (i.e., 9.5 per cent); 2 if the incidence is between the 25th and 75th percentiles (i.e., between 9.5 per cent and 20.8 per cent) and 3 if it is higher than the 75th percentile;
- percentage of teachers aged over 55.

In order to control for differences within Tuscany, we include in the model dummies for zonal conferences, which are 35 territorial units aimed at the coordination and planning of the Tuscan education system at the local level.

Tables 6.1 and 6.2 report descriptive statistics on the dependent variables and covariates. Note that both dependent variables range between 0 and 100, with the maths score showing a slightly lower average value and a higher variability than the reading score.

Table 6.1 Descriptive statistics on continuous variables

	Level	*Mean*	*Std. Dev.*	*Min*	*Max*
Maths score	individual	69.63	16.60	0.00	100.00
Reading score	individual	73.93	14.10	0.00	100.00
ESCS	individual	0.11	0.97	–3.14	2.61
Late students in school's grade 5 classes (%)	school	5.87	6.83	0.00	50.00
Average value of ESCS per school	school	0.08	0.40	–1.52	1.47
Conservation status of the scholar building	school	5.20	0.63	2.14	6.00
Teachers with fixed-end contract per school (%)	school	15.78	8.62	0.00	45.71
Teachers per school older than 55 years (%)	school	28.16	9.21	0.00	55.20

Table 6.2 Descriptive statistics on categorical and dummy variables

	Level	*Proportion (%)*	*No. of Obs.*
Male	individual	50.94	24,199
Foreign	individual	13.2	24,199
Late	individual	3.8	24,199
Full time	individual	42.21	24,199
Small class	class	5.73	1,397
Medium class	class	90.55	1,397
Large class	class	3.72	1,397

Results

The multilevel model

Results of the multilevel analysis, obtained via the xtmixed command of Stata (Stata 2011) are shown in Tables 6.3 and 6.4.

The overall variability is higher in maths scores than in reading scores. The empty model results show that most of the variance is at student level, even though between-school variance is significantly different from 0, suggesting the existence of some degree of segmentation among schools. Indeed, 22.4 per cent of the variance in math scores and 19 per cent of variance in reading scores is explained by between-schools variability.

Pupil covariates (see column B of Tables 6.3 and 6.4) reduce unexplained pupil-level variance and also unexplained between-school variance, highlighting the importance of compositional effects. The inclusion of school variables (see column of C of Tables 6.3 and 6.4) reduces between variance in both the maths and reading model, although the unexplained variability remains high, stressing the relevancy to look for the role of spatial factors in determining differences between schools. However, it turns out that the inclusion of spatial dummies representing zonal conferences (see column D of Tables 6.3 and 6.4), does not explain much between-school variance in test scores.

In the end, the model explains only a small part of the total variance (10.2 per cent for maths and 12.8 per cent for reading), leaving the majority of it in the residuals which collects all unobserved factors at the individual and school level. At the pupil level the main unobserved factors can be reasonably identified with the pupil's ability to learn and inclination to study, while school-level residuals can be interpreted as school effectiveness, adjusted for the available explanatory variables. In turn, school effectiveness is strictly linked to the ability and vocation of teachers and to management quality, factors which are difficult to measure.

The categorical variable on class size provides very interesting results in the maths model, showing that being in a small-sized class significantly disadvantages pupils. Such a result can be partly explained by the fact that most small classes (under 10 pupils) are grouped together with other grades' classes into a single multi-grade class, determining a learning environment which is certainly not optimal.

With respect to school-level variables, the model estimation confirms the important influence that the school catchment area exerts on pupil performance, especially in maths. Indeed, both the average school ESCS and the percentage of late students in grade 5 have a statistically significant effect on test scores, which is positive in the former case and negative in the latter.[9] One interesting result is on the size of the municipality where the school is located, which seems to indicate that small-sized municipalities favour pupil learning outcomes, probably thanks to a better institutional environment and closer relationships between school and families.

With regard to school's resources, the analysis shows that they play a certain role in explaining pupils' test performance; however, it appears to be more their quality than quantity that makes the difference. Indeed, the number of computers per student, financial resources and student–teacher ratio, included in an early version of the model, do not have a statistically significant effect on pupils' outcomes. In contrast, two variables used as proxies for the quality of resources appear to be statistically significant: the maintenance level of school buildings has a positive and statistically significant impact on student achievement (only in the maths model) and the percentage of fixed-term teachers a negative one, even if only when it is higher than the 75th percentile. Instead, no effect is found for the age of teachers: student outcomes do not appear to be influenced by a higher percentage of mature teachers. Together with the result on temporary teachers, this finding shows that the quality of school's human resources matters, even though this quality lies more in the continuity of the relationship with pupils than in teachers' personal features.

Column D in Tables 6.3 and 6.4 shows the results of the model with spatial dummies. Coefficients of dummies are not listed in the tables, because most of them are not significant. However, the aggregate significance of the zonal conference dummies is confirmed by the likelihood-ratio test, indicating that the placement in a given administrative area can make a difference to pupils' educational outcomes.

This result appears to be confirmed by the estimated three-level model of pupils' test scores,[10] where the third level is represented by zonal conferences; indeed, the between-areas variance is very limited and not explained by spatial covariates (economic specialization, average income), which do not have any statistical significant effect on pupils' test scores.

Given the limited variance explained by the inclusion of zonal conference dummies, in what follows we refer to results obtained with the model without spatial dummies (column C of Tables 6.3 and 6.4).

Expected test scores for different profiles

Considering model C of Tables 6.3 and 6.4, we computed the expected maths and reading scores for some hypothetical pupil and context profiles, in order to better

Table 6.3 Two-level linear model for maths score

	A	*B*	*C*	*D*
	Empty	*Individual variables*	*+ school variables*	*+ zonal conference dummies*
Constant	*69.3****	*68.2****	*66.1****	*68****
Male		2.14***	2.14***	2.14***
Escs		3.95***	3.91***	3.91***
Foreign		–3.62***	–3.60***	–3.60***
Late		–8.01***	–7.92***	–7.87***
LateXforeign		6.24***	6.20***	6.14***
Full time		0.40	0.34	0.33
Class size: less than 10 pupils			–2.9**	–1.61
Class size: more than 25 pupils			1.47**	1.39**
Late students in grade 5 classes (%)			–0.09**	–0.07
Average school escs			1.87**	1.56*
School building status			0.857*	0.61
Fixed-term teachers (%): medium			–0.743	–1.57*
Fixed-term teachers (%): high			–2.60***	–3.95***
Teachers older than 55 (%)			–0.05	–0.05
Inverse of municipality's population			3705**	3329*
Territorial dummies	no	no	no	yes
Between variance	63.61	58.97	56.31	52.20
Within variance	220.34	202.84	202.80	202.84
Total variance	283.95	261.81	259.11	255.04
% between over total	22.4%	22.5%	21.7%	20.5%
% change in between variance	–	–7.3%	–4.5%	–7.3%
% change in within variance	–	–7.9%	0.0%	0.0%
LR test vs. linear regression: chibar2(01)	3545.94	3588.28	3368.97	3240.89
Prob >= chibar2	0.00	0.00	0.00	0.00

understand the importance of each determinant. In this exercise we consider a pupil with level-1 residual equal to zero and a school with level-2 residual equal to 0 (i.e., average unobserved pupil and school characteristics).

We considered the following three pupil profiles:

- the lucky pupil – male in the case of maths and female in the case of reading, Italian, non-late and with a high ESCS (equal to the 90th percentile);
- the unlucky pupil – male in the case of reading and female in the case of maths, foreign, late and with a low ESCS (equal to the 10th percentile);
- the median pupil – Italian, non-late and with the median ESCS.

Table 6.4 Two-level linear model for reading score

	A	*B*	*C*	*D*
	Empty	*Individual variables*	*+ school variables*	*+ zonal conference dummies*
Constant	*74****	*75.2****	*77.7****	*77.8****
Male		–0.37**	–0.36**	–0.37**
Escs		3.36***	3.34***	3.34***
Foreign		–5.58***	–5.57***	–5.56***
Late		–7.66***	–7.55***	–7.55***
LateXforeign		3.19***	3.15***	3.14***
Full time		–0.90***	–0.87***	–0.78***
Class size: less than 10 pupils			–1.22	–0.91
Class size: more than 25 pupils			–0.02	–0.07
Late students in 5th grade classes (%)			–0.11***	–0.090**
Average school escs			0.49	0.45
School building status			–0.16	–0.37
Fixed-term teachers (%): medium			–0.948*	–1.25*
Fixed-term teachers (%): high			–2.88***	–3.34***
Teachers older than 55			0.00	–0.00
Inverse of municipality's population			854	1574
Territorial dummies	no	no	no	yes
Between variance	38.68	34.43	32.47	30.31
Within variance	164.79	147.19	147.22	147.18
Total variance	203.48	181.62	179.69	177.49
% between over total	19.0%	19.0%	18.1%	17.1%
% change in between variance	–	–11.0%	–5.7%	–6.6%
% change in within variance	–	–10.7%	0.0%	0.0%
LR test vs. linear regression: chibar2(01)	2876.81	2860.5	2648.94	2477.78
Prob >= chibar2	0.00	0.00	0.00	0.00

We also considered the following context profiles:

- good school – medium-sized class, low percentage of late students in the school (equal to the 10th percentile), high average school ESCS (equal to the 90th percentile), low percentage of fixed-term teachers (lower than the 25th percentile);
- bad school – small-sized class, high percentage of late students in the school (equal to the 90th percentile), low average school ESCS (equal to the 10th percentile), high percentage of fixed-term teachers (higher than the 75th percentile);
- median school – median sized class, median percentage of late students in the school, median school mean ESCS, median percentage of fixed-term teachers (between the 25th and the 75th percentile).

Table 6.5 Expected scores for different profiles of pupil and school

MATHS				
		SCHOOL		
		Bad	Average	Good
PUPIL	Unlucky	52.50	58.33	61.00
	Average	63.81	69.64	72.30
	Lucky	70.04	75.94	78.61
READING				
		SCHOOL		
		Bad	Average	Good
PUPIL	Unlucky	56.39	60.32	62.71
	Average	70.72	74.65	77.04
	Lucky	75.39	79.33	81.72

Table 6.5 reports the nine profiles obtained by crossing pupil profiles with context profiles. In this way, it is possible to compare the expected score of a certain type of pupil when attending a good, average or bad school. For example, a lucky pupil's maths score can range between 70.04 and 78.61, depending on the school's observable characteristics. The same happens with the reading score, which for an unlucky pupil can range between 56.39 and 62.71 depending on the type of school.

However, test scores can differ significantly also in relation to unobservable factors and thus to school effectiveness. To show how important the latter factor can be, Figure 6.1 reports regression lines of maths scores with respect to ESCS for an average pupil in an average school for different values of level-2 residuals.

School rankings

As already said, level-2 residuals can be interpreted as school effectiveness, conditional on observed pupil and context covariates. We ranked Tuscan schools according to their effectiveness, estimated separately for maths and reading. Figure 6.2 shows the empirical Bayes predictions of level-2 residuals for maths and reading models together with their confidence intervals: only few schools, in the upper right and lower left part of the graph have a predicted residual significantly different from 0. These schools should be better investigated and monitored to correct bad practices (schools with a residual in the lower left part of the graph) and to discover determinants of good practice (schools with a residual in the upper right part of the graph).

Afterwards, from the two rankings we indentified the best (more effective) and worst (least effective) schools in reading and maths. Then, we selected the 46 best Tuscan schools, those showing to be effective for both maths and

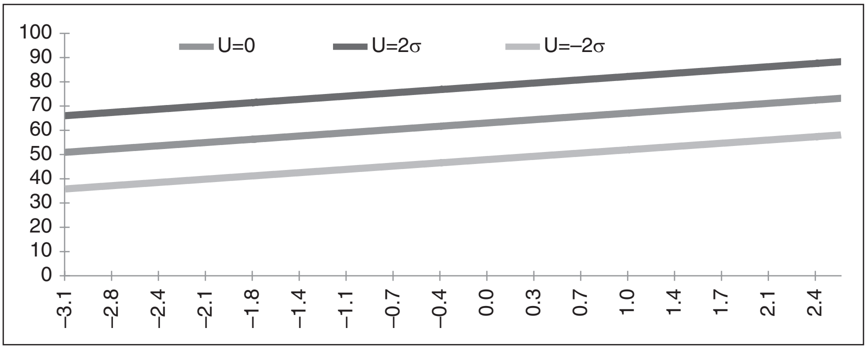

Figure. 6.1 Expected maths score for different individual ESCS and school effectiveness

reading; similarly, we selected the 30 worst Tuscan schools, resulting to be ineffective for both maths and reading.

The identification and mapping of such schools in the Tuscan region is hindered by the anonymity imposed by the privacy policy of INVALSI. Nonetheless, the distribution by zonal conference (Table 6.6) shows that the best and worst schools of Tuscany are not homogeneously distributed among geographical areas.

In particular, some areas show a prevalence of good schools over bad ones (in light grey in Figure 6.3), while in some others bad schools outnumber good ones (in dark grey in Figure 6.3). At the same time, many zonal conferences show a uniform degree of effectiveness of schools (in white in Figure 6.3); in some of them this is due to the presence of only medium-effective schools, in others to the same number of good and bad schools.

This is a very important result for the evaluation of the regional education system, which can be used by policy-makers to identify areas deserving particular

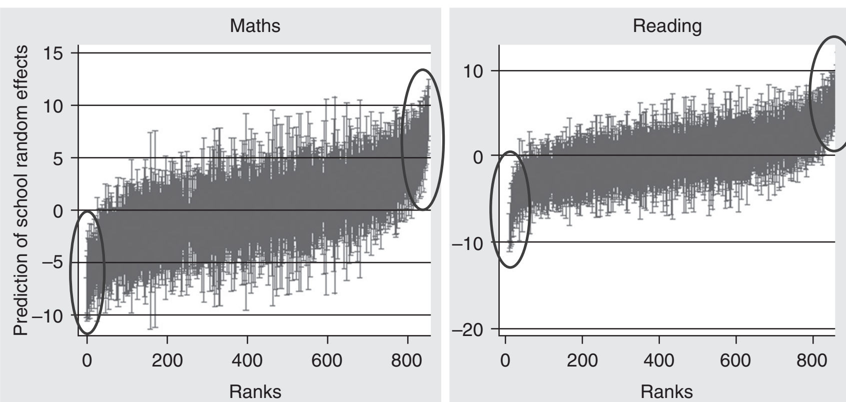

Figure. 6.2 Ranking of Tuscan primary schools by level-2 residuals from the maths and reading models of Tables 6.3 and 6.4, column C

Table 6.6 Best and worst primary schools by zonal conference

Zonal conference	*No. of schools*	*BEST*		*WORST*	
		No.	*(%)*	*No.*	*(%)*
Alta Val d'Elsa	13	0	0	0	0
Amiata – Val d'Orcia	7	0	0	0	0
Amiata Grossetana	7	0	0	0	0
Apuane	46	3	7	2	4
Aretina	35	1	3	0	0
Bassa Val di Cecina	14	0	0	2	14
Casentino	15	0	0	0	0
Colline dell'Albegna	16	1	6	0	0
Colline Metallifere	17	0	0	1	6
Elba	9	0	0	1	11
Empolese	37	5	14	0	0
Fiorentina Nord-Ovest	36	4	11	1	3
Fiorentina Sud-Est	25	0	0	0	0
Firenze	44	4	9	2	5
Grossetana	25	1	4	2	8
Livornese	23	5	22	2	9
Lunigiana	20	1	5	0	0
Mugello	14	0	0	0	0
Piana di Lucca	36	1	3	2	6
Pisana	46	3	7	2	4
Pistoiese	47	0	0	4	9
Pratese	44	2	5	3	7
Senese	22	2	9	0	0
Val d'Era	39	3	8	0	0
Val di Cecina	12	0	0	0	0
Val di Chiana Aretina	19	0	0	1	5
Val di Chiana Senese	12	0	0	0	0
Val di Cornia	12	1	8	0	0
Val di Nievole	28	4	14	1	4
Val Tiberina	9	0	0	1	11
Valdarno	23	2	9	0	0
Valdarno e Valdisieve	11	0	0	1	9
Valdarno Inferiore	15	1	7	1	7
Valle del Serchio	31	1	3	1	3
Versilia	39	0	0	0	0

Note: the number of schools refers to the number of schools in our database after the cleaning process and not to the real number of schools in each zonal conference.

attention. Obviously, this instrument could be strengthened by allowing researchers and policy-makers to identify the effectiveness of single schools.

Conclusions

In this paper we analysed the determinants of INVALSI test scores for 24,199 pupils in 848 primary schools in Tuscany. Our analysis exploited a novel database

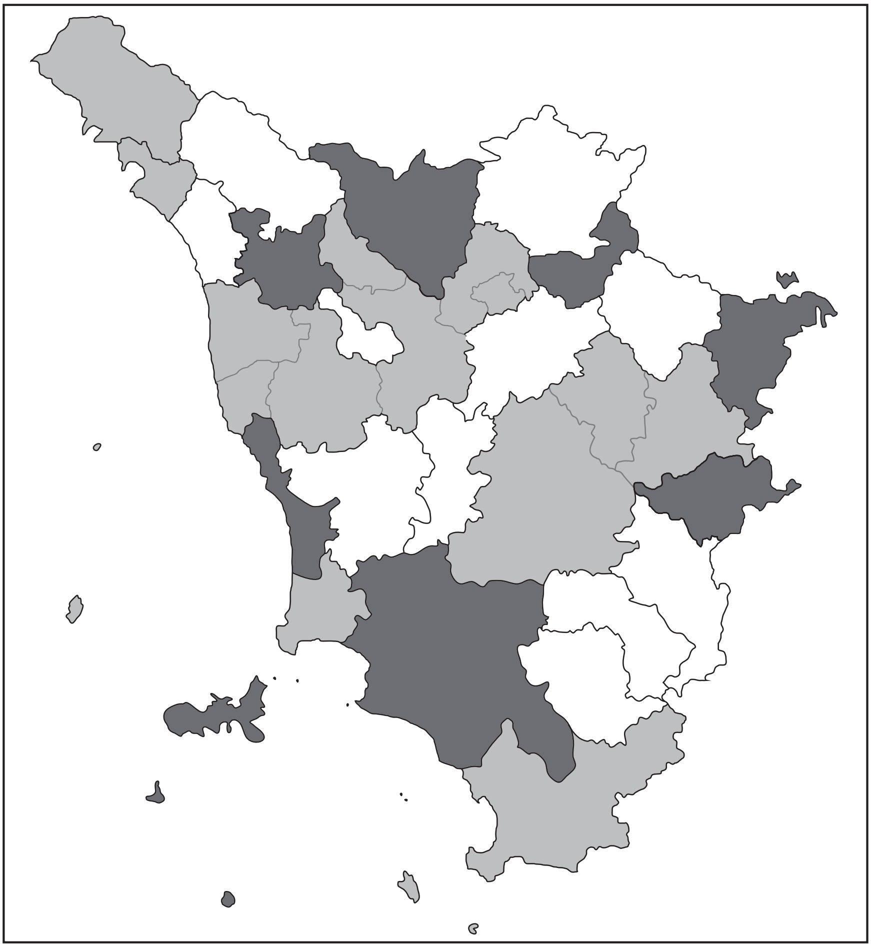

Figure 6.3 Zonal conferences by degree of homogeneity of school effectiveness

Notes: light grey areas are those with a prevalence of good schools over bad, dark grey areas are those with a prevalence of bad schools over good. and white areas are those with a uniform degree of effectiveness of schools.

collecting data on test scores, individual and school characteristics and information at the level of small territorial units, i.e. zonal conferences.

We used a multilevel approach in order to properly account for the hierarchical structure of data, finding that a significant part of test score variance is explained by between-schools variance.

The model shows that pupil variables explain most of the variance in pupils' achievement: being foreign, repeating one or more year and having a poor socio-economic and cultural family background drastically reduces both maths and reading test scores. When looking at the school-level variables, it turns out that the composition of the student body (included to catch the so-called 'peer effect') matters much more than school resources; however, the quality of resources appears also to exert a certain influence on the achievement of pupils, especially when it comes to the stability of the teaching body. Finally, spatial differences appears to matter little for pupil test scores in Tuscan primary schools; this is a positive result, which seems to show the limited role of pupils' residential area in determining their educational attainments. However, we should consider the fact that some school-level covariates already explain differences in the performance of pupils' attending schools in different areas of Tuscany. Thus, a pupil attending a school in a remote area is disadvantaged by the typical characteristics of a marginal school (high percentage of fixed-term teachers due to self-selection processes, small class size) and not by the school's location itself.

The ranking of schools according to level 2 residuals, interpreted as level of effectiveness once accounted for observed variables, has revealed a non-homogenous distribution of effective and ineffective schools among areas. This is a very important result for the evaluation of the regional schooling system, which could be used by policy-makers to identify the areas deserving particular attention. Clearly, it would be beneficial to inform policy-makers of individual schools' effectiveness, in order to enable targeted action.

Given the availability of such a rich database, we conclude by specifying our intentions for further research. First of all, our analysis on Tuscan primary schools could be enhanced considering a bivariate multilevel model, in order to account for the covariance between the two scores. Second, we intend to continue the analysis of Tuscan school effectiveness by considering secondary schools, where the higher average school size allows to consider a three-level model, with classes nested into schools, in order to look for within-school segmentation and measure teacher effectiveness.

Notes

1 The evaluation of schools' performance does not have a long tradition in Italy; only in 2007 was a national committee (*Istituto Nazionale per la Valutazione del Sistema Educativo di Istruzione e di Formazione* or INVALSI) established with the specific purpose of assessing the competences acquired by pupils and thus evaluating the role of schools.

2 Zonal conferences for education (*conferenze zonali*) are territorial units covering several municipalities, which are aimed at the coordination and planning of the Tuscan education system at the local level. Established by LR 5/2005, they have as a primary goal the planning of primary and lower secondary education at a local level, by coordinating the action of the municipalities belonging to them. For a description of characteristics and functions of Tuscan zonal conferences, see IRPET (2012).

3 See Bratti *et al*. (2007) for a review of the literature on the role played in pupil performance by family features other than cultural/socio-economic factors.

4 Given the richness of our database, which contains data at the individual, class, school and territory levels, we have also attempted to exploit its potential by

estimating a three-level model. A first attempt concerned the insertion of the class level, which showed that in the empty model the percentage of variance explained by the class is almost equal to that explained by the school. However, when the second-level covariates are added, the variance between classes remains unchanged, indicating that the variability of learning between classes depends on factors other than the class composition, such as the quality of the teacher. Despite the relevance of the result, the model suffered from the low number of classes per school (1.6), due to the fact that 54.8 per cent of schools has only one class, and were thus dropped from the analysis. A second attempt concerned the insertion of the territorial level, represented by zonal conferences. A brief description of the results of this model are presented later in this chapter.

5 The number of classes and schools differs in the maths and reading databases because some classes and schools have missing values in one of the two test scores.

6 More specifically, these 'goods' include: a quiet place to study, a personal desk for homework, encyclopedias, internet connection, burglar alarm, a room exclusively for the student, more than one bathroom, more than one car in the family, more than 100 books.

7 Among Tuscan pupils, the ESCS value ranges between –3.14 and 2.61, with an average of 0.11, slightly higher than the Italian average of 0.

8 For an analytical description of the variable's construction method, see IRPET (2012).

9 Among school composition variables, we also included the percentage of immigrant pupils in grade 5 classes: this covariate revealed a very little explanatory power and its inclusion reduced the slope of late pupils. In our interpretation, this is due to the fact that in most cases (70 per cent) late pupils are foreigners, probably recent immigrants, held in the same grade for an extra year because of language difficulties etc. We then conclude that the presence of foreigners not held back in the school does not significantly influence the performance of pupils.

10 Results are not shown in this paper and are available from authors upon request.

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Part II

Short-term choices with long-term consequences

Health, leaving home and intergenerational mobility

7 Smoking, drinking, never thinking of tomorrow

Income and risky choices amongst young adults in the UK

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Introduction

In this chapter we look at the relationship between health and income as mediated by 'lifestyle' choices; that is, a set of behaviours which are thought to influence health and are generally considered to involve a substantial degree of free choice (Contoyannis and Jones 2004). The main underlying assumption is that individuals are co-producers of their own health.

The chapter is divided into two parts. First, we present a theoretical model where health affects a consumer's utility through a health production function in which health is the output and consumer goods are the inputs. Employing this approach, a Lifestyle Return to Scale (LRS) parameter is defined. The first result is that an increase in a consumer's personal income may have a positive or a negative effect on health; in other words, health may be a normal or an inferior good, depending on the LRS parameter.

In the second part of the chapter, we estimate an empirical model of health-related choices and outcomes. In the literature there are contrasting findings with some cross-section estimates of income and health finding negative income effects, whilst casual observation (e.g. higher mortality rates amongst the poor) suggest a positive relation. The explanation for this lies in the distinction between permanent and transitory (or evolutionary) income effects. In what follows, we focus on the latter transitory aspects although, for the purposes of comparison, we report also cross-section estimates. Specifically, we employ two waves (at ages 26 and 29) of the British Cohort Study, a multiple-wave longitudinal survey of people born in one week (5–11 April 1970), in order to estimate a differenced model of the effects of changes in wage income on changes in health-related indicators in order identify current income effects along the lines of the analysis of Dustmann and Windmeijer (2000).

We find that there are substantial differences between the permanent and transitory income determinants, also in terms of the direction of the effects. Moreover, we find that income effects often differ significantly in size and sometimes sign according to whether the income change was positive or negative. This is attributed to the dependence-creating nature of the consumption goods involved (smoking cigarettes and drinking alcohol) and their role as anxiety-reducing goods, which suggests that the simple theoretical model outlined here – some form of which is usually employed to analyse these issues – is not fully adequate to deal with the type of lifestyle consumption goods considered here. We indicate the lines along which a model needs to be developed in order to take this more fully into account, based on the rational addiction approach originating with Becker *et al*. (1994).

A simple theoretical model

As is well known, at the core of utilitarianism, from which the consumer's utility function is derived, is the assumption that motivations determine human action. These motivations are mostly identified with pleasure and hence 'utility'; it is (usually) exclusively individual, and its cause is not in itself a central issue of interest for economic analysis. For this reason, utilitarianism must be seen within the framework of consequentialism in which the analysis is end-state oriented instead of following an *a priori* approach.

In his *Ethics*, Spinoza says that by good 'I mean every kind of pleasure, and all that conduces thereto, and especially that which satisfies our longing, whatsoever that may be. By evil, I mean every kind of pain especially what frustrates our longings.' For this reason 'we in no case desire a thing because we deem a thing good but, contrariwise, we deem a thing good because we desire it' (Spinoza 2007, Part 3, XXXIX).

However, it is precisely the internal mental conflict that underlies at least some consumer choices that may be useful for the analysis of consumer behaviour. This mechanism can be found not only in the thought of the ancient Greeks, such as Plato's tripartite theory of the soul, but even, from a different perspective, in neoclassical theory. For example, Jevons (1888) states:

> It will be readily conceded that pain is the opposite of pleasure; so that to decrease pain is to increase pleasure; to add pain is to decrease pleasure. Thus we may treat pleasure and pain as positive and negative quantities are treated in algebra. The algebraic sum of a series of pleasures and pains will be obtained by adding the pleasures together and the pains together, and then striking the balance by subtracting the smaller amount from the greater. Our object will always be to maximise the resulting sum in the direction of pleasure, which we may fairly call the positive direction. This object we shall accomplish by accepting everything, and undertaking every action of which the resulting pleasure exceeds the pain which is undergone; we must avoid every object or action which leaves a balance in the other direction.

This implies that it is possible to model consumer choice through the comparison between pleasure and pain. Furthermore, if we include health in the utility function, a consumer's choice depends on the weighted comparison between the utility of the products and the subjective relative weight that the same products have on consumer's health.

One of the theoretical results that the model predicts is that health can be an inferior good even if all other products are normal; the nature of health, as normal, neutral or inferior good, depends on the returns to scale of the health production function.

Static analysis

Starting from Wagstaff's (1986) model and also from Contoyannis and Jones's (2004) hypothesis, Coppola (2012) developed a micro model of consumer's choice in order to better define a measure of lifestyle and then to explain the effects of a consumer's choices on his health status. The first important result of this model, which we generalize, is that an increase in a consumer's personal income may have a positive or a negative effect on his health if the same consumer has a good or a 'bad' lifestyle.

The model includes two equations: the consumer's utility function; and the health production function. Health is in the consumer's utility function. But, in contrast to Wagstaff (1986) and Contoyannis and Jones (2004), we assume that all commodities are both in the utility function, and in the health production function. In particular, the arguments of the consumer's utility function are both health and the other commodities. Among these there are commodities that may have a positive, null, or negative impact on health, such as smoking, alcohol or drugs.

We define the consumer's utility function as:

$$U = u(H, \mathbf{m}), \tag{7.1}$$

where H is health and $\mathbf{m}$ is a commodity vector or commodity bundle; $m_i \in \mathbf{m}$ is the single commodity. Furthermore, we assume that

$$\frac{dU}{dH} \geq 0, \ \frac{dU}{dm_i} \neq 0,$$

and also that there exists at least one commodity $m_i \in \mathbf{m}$ of which the marginal utility is positive,

$$\exists m_i : \frac{dU}{dm_i} > 0$$

The health production function is given by

$$H = h(\mathbf{m}, \Omega), \tag{7.2}$$

where Ω includes other factors that affect health, and with

$$\frac{dH}{dm_i} \neq 0$$

and

$$\exists m_i : \frac{dU}{dm_i} \neq 0.$$

Substituting equation (7.2) into equation (7.1) gives:

$$U = u(h(\mathbf{m},\Omega),\mathbf{m}) \tag{7.3}$$

so that

$$\frac{dU}{dm_i} = \frac{d[u(h(\mathbf{m},.\Omega),\mathbf{m})]}{dh(\mathbf{m},\Omega)}\frac{dh(\mathbf{m},.\Omega)}{dm_i} + \frac{d[u(h(\mathbf{m},.\Omega),\mathbf{m})]}{dm_i}. \tag{7.4}$$

The vector **m** may be partitioned into four sub-vectors:

$$\mathbf{m}' = \left[\mathbf{m}'_{u+,h+}, \mathbf{m}'_{u+,h-}, \mathbf{m}'_{u-,h-} . \mathbf{m}'_{u-,h+}\right], \tag{7.5}$$

where $\mathbf{m}'_{u+,h+}$ is a sub-vector of commodities m_i that affect positively both the utility $\frac{dU}{dm_i} > 0$ and the health $\frac{dH}{dm_i} > 0$, while $\mathbf{m}'_{u+,h-}$ is a sub-vector of commodities m_i that positively affects the consumer's utility $\frac{dU}{dm_i} > 0$ but negatively his health $\frac{dH}{dm_i} < 0$ and so on.

The total effect of a change of **m** on utility is equal to

$$\frac{dU}{dm_i} = \frac{d[u(h(\mathbf{m},.\Omega),\mathbf{m})]}{dh(\mathbf{m},\Omega)}\frac{dh(\mathbf{m},.\Omega)}{dm_i} + \frac{d[u(h(\mathbf{m},.\Omega),\mathbf{m})]}{dm_i} > 0. \tag{7.6}$$

The consumer decides *how much* to consume of the single commodity through the simple optimization problem:

$$\max_{m_i \geq 0}\left[u(h(\mathbf{m},\Omega),\mathbf{m})\right] \text{ such that } \mathbf{p}'\mathbf{m} = y, \tag{7.7}$$

where $\mathbf{p}'$ is the price vector and y is income. The solution of the maximization problem gives the optima $m_i = m(p,y)$ and $H = h(p,y)$.

In order to clarify ideas, let us suppose there are only two commodities: $x \in \mathbf{m}'_{u_+,h_+}$, $z \in \mathbf{m}'_{u+,h+}$. and Cobb–Douglas utility and health production functions, so that utility is given by

$$U(H,x,z) = H^{\alpha}x^{\beta}z^{\delta}, \tag{7.8}$$

where α, β and δ are parameters. $a \geq 0$ may be considered the weight given to his own health by the consumer.

The individual consumes a commodity only if the relevant parameter is positive. We suppose that $\beta > 0$ and $\delta > 0$, $\frac{dU(\cdot)}{dx} > 0$; $\frac{dU(\cdot)}{dz} > 0$, and also that $\frac{d^2U(\cdot)}{dx} < 0$; $\frac{d^2U(\cdot)}{dz} < 0$. This is clearly a static equation and there is no rational addiction.

According to Wagstaff (1986) and Contoyannis and Jones (2004), consumption may affect a consumer's health, and for this reason the consumer is a co-producer of his own health.

For the sake of simplicity, let us assume that a commodity can only either better or worsen a consumer's health status. In other words, there is no commodity that has a positive impact on health for small quantities and a negative impact for stronger doses. It assumes also that x improves health, while z worsens health.

It is possible to write the health production function as

$$h(x,z,\Omega) = \Omega x^{\rho} z^{-\gamma}, \tag{7.9}$$

where $\rho - \gamma$ is equal to the elasticity of scale and may be positive, negative or null. Let $\theta = \rho - \gamma$. For Sassi and Hurst (2008) individual lifestyles are related to those individual behavioural traits that occupy a central position because of their direct influences on individual health. Also Contoyannis and Jones (2004) define a lifestyle 'as a set of behaviours which are considered to influence health'.

If $\theta > 0$ an increase in the consumption of the good has a positive effect on health, while for $\theta < 0$ this effect is negative. With $\theta = 0$ the consumer behaviour has no effect on health. For this reason the parameter θ may be defined as the LRS.

Substituting equation (7.9) into equation (7.8), one obtains

$$U(H,x,z) = \Omega x^{\alpha\rho} z^{-\alpha\gamma} x^{\beta} z^{\delta} \tag{7.10}$$

or

$$U(H,x,z) = \Omega x^{\alpha\rho+\beta} z^{\delta-\alpha\gamma}. \tag{7.11}$$

The elasticity with respect to x becomes $\alpha\rho + \beta$ and the elasticity with respect to z will be $\delta - \alpha\gamma$. The good z will be consumed only if $\delta - \alpha\gamma > 0$. Hence, the choice of consuming z depends on three parameters: the elasticity δ with respect to z, that is to say, the weight that the consumer confers on the good z; α, the importance of health for the consumer; and the measure of the damage z causes to health (γ).

It is useful to note that consumer can decide to consume z even if he knows that z is dangerous for his health. Thus, the decision does not depend, for example, only on the consumer's level of education. Even someone well aware of the damage that smoking produces may continue to smoke if he likes it very much.

Including health in the consumer's utility function, however, does increase the consumption of those goods that benefit health and decreases the consumption of those which cause damage.

Let $\Omega = 1$. The consumer's budget constraint is $p_x x + p_z z = Y$, where p_x, p_z are the prices of the goods, and Y is income. The consumer maximizes his utility when[1]

$$\max_{x,z} x^{\alpha\rho+\beta} z^{\delta-\alpha\gamma} \text{ such that } p_x x + p_z z = Y \tag{7.12}$$

We solve the Lagrangian $\max_{x,z} L = U(x,z) - \lambda\left(p_x x + p_z z - Y\right)$, where λ is the Langrage multiplier. At the optimum the goods consumed are:

$$x = \frac{\alpha\rho + \beta}{\beta + \delta + \alpha(\rho - \gamma)} \frac{Y}{p_x}, \tag{7.13}$$

$$z = \frac{\delta - \alpha\gamma}{\beta + \delta + \alpha(\rho - \gamma)} \frac{Y}{p_z}. \tag{7.14}$$

The weight of health, a, increases the consumption of the 'virtuous' good and reduce the consumption of the harmful one. At the optimum, the health level is

$$H = \left(\frac{\alpha\rho + \beta}{\beta + \delta + \alpha(\rho - \gamma)} \frac{cy}{p_x}\right)^{\rho} \left(\frac{\delta - \alpha\gamma}{\beta + \delta + \alpha(\rho - \gamma)} \frac{Y}{p_z}\right)^{-\gamma} \tag{7.15}$$

or

$$H = \left(\frac{\alpha\rho + \beta}{\beta + \delta + \alpha(\rho - \gamma)}\right)^{\rho} \left(\frac{\delta - \alpha\gamma}{\beta + \delta + \alpha(\rho - \gamma)}\right)^{-\gamma} \left(\frac{(p_z)^{\gamma}}{(p_x)^{\rho}}\right) (Y)^{(\rho - \gamma)}, \tag{7.16}$$

where

$$\left(\frac{\alpha\rho + \beta}{\beta + \delta + \alpha(\rho - \gamma)}\right)^{\rho} \text{ and } \left(\frac{\delta - \alpha\gamma}{\beta + \delta + \alpha(\rho - \gamma)}\right)^{-\gamma}$$

are respectively the share of commodities x and z weighted for their own elasticity with respect to health.

The level of health and the price of the virtuous good are negatively correlated. If the price of good x increases (decreases), it worsens (betters) the level of health. In contrast, H improves (worsens) if the price of z increases (decreases).

The elasticity of health with respect to income is $p - \gamma = \theta$, the LRS parameter. Unlike the other parameters that can have only one sign, the elasticity of health with respect to income may be positive or negative. If $p - \gamma = 0$, income growth does not affect the level of health. If $p - \gamma < 0$, income affects health negatively. If $p - \gamma > 0$ it affects it positively.

In other words, health may be an *inferior* 'good' $(\gamma > p)$, even if all the other commodities used by the consumer are *normal* 'goods'.

Dynamic analysis

The model still does not explain, however, both in its general form or in its simplified Cobb–Douglas incarnation, the existence of possible asymmetric effects. These may be explained by introducing the notion of generalized addiction. In fact, if we suppose that the commodities that are bad for one's health, such as cigarettes and alcohol, are also those ones that are addictive, we need to relax the additive-separability assumption in order to model the consumption of addictive goods (Becker *et al*. 1994).

Furthermore, we can consider a simple model of Grossman and Chaloupka (1998) that, following Becker *et al*. (1994), assumes that consumers maximize a lifetime utility function given by:

$$V = \sum_{t=1}^{\infty} \mu^{t-1} U\left(C_{1,t}, C_{2,t}, C_{2,t-1}, e_t\right), \tag{7.17}$$

where $C_{1,t}$ is consumption of non-additive good at time t and $C_{2,t}$ is consumption of an additive good at age t, e reflects the effects of measured and unmeasured life cycle variables on utility and is the time discount factor. In our case, we can assume that C_1 is the commodity named x and C_2 is z.

If the utility function is quadratic and the rate of time preference is equal to the market rate of interest, the motion equation of the current consumption of the addictive good is

$$z_t = \xi z_{t-1} + \mu z_{t+1} + \xi_1 P_t + e_t\,. \tag{7.18}$$

Here ξ, ξ_1, ξ_2 are non-zero parameters. Substituting z_{t-1} in z_t and so on, we obtain

$$z_t = \frac{1}{1-\mu\xi^2}\left\{\xi_1 \sum_{i=0}^{T} \xi^i P_{t-1} + \xi_2 \sum_{i=0}^{T} \xi^i e_{t-1} + \mu \sum_{i=0}^{T} \xi^{2+i} z_{t-1} + \xi\mu z_{t+1} + \xi^i z_{t-1}\right\}. \tag{7.19}$$

This means that consumption of z at time t depends essentially on the moving average of the errors (shocks).

If we decompose the error term e_t into

$$e_t = \omega_1 e_{+,t} + \omega_2 e_{-,t} \tag{7.20}$$

and suppose that the positive errors and the negative errors have a different impact on consumption, we obtain the asymmetric effects

$$z_t = \frac{1}{1-\mu\xi^2}\left\{\xi_1 \sum_{i=0}^{T} \xi^i P_{t-1} + \xi_3 \sum_{i=0}^{T} \xi^i e_{+,t-1} + \xi_4 \sum_{i=0}^{T} \xi^i e_{-,t-1} \right.$$
$$\left. + \mu \sum_{i=0}^{T} \xi^{2+i} z_{t-1} + \xi\mu z_{t+1} + \xi^i z_{t-1}\right\} \tag{7.21}$$

where $\xi_3 = \xi_2\omega_1$ and $\xi_4 = \xi_2\omega_2$. Furthermore, with $\xi_3 > 0$ and $\xi_4 < 0$, any shock, both positive and negative, will cause an increase in the consumption of z. In the special case where $\xi_4 = -\xi_3$, the consumption of z depends on the absolute error e_t. In other words, any shock, positive or negative, causes an increase in z_t.

Empirical analysis

The model outlined provides the theoretical justification for either positive or negative income effects with regard to the consumption of goods which provide both direct utility benefits and indirect disutility through their health effects, which in turn will depend on individuals' preferences. The model leads fairly naturally to the empirical estimation of behavioural choices likely to affect health. In this section, we look at two specific types of 'consumption' behaviour likely to be detrimental to health – smoking tobacco products and drinking alcohol – as well as at one 'intermediate' outcome of health-related behaviour – the body mass index (BMI), and a (subjective) measure of the 'final' outcome, the state of health of the individual. Using longitudinal data, we estimate the effects of changes in wage income on changes in the aforementioned health-related indicators so as to identify the effects of current/transitory income changes on health-related behaviour and outcomes. This is quite distinct from any permanent income (and other non-income- related time-invariant) effects which show up in the cross-section results. For comparison purposes, we also report the latter in the main tables.

The focus on a dynamic model also attenuates the potential endogeneity of income effects. That is, rather obviously, a negative correlation between unhealthy behaviour and wages may arise as a consequence of unhealthy workers earning less. Equally obviously, regressing temporal changes on temporal changes, any time-invariant characteristic influencing the dependent variable disappears. The most closely related precursor of this analysis is the paper by Dustmann and Windmeijer (2000) which identifies transitory income effects on behaviour through a differencing approach similar to that adopted here.

This analysis is also related to a line of research concerned with dependency in consumption[2]. Cigarettes and alcohol, as well as having negative health effects, are also goods which create dependence in consumers;[3] this implies that consumption of the good now is likely to be highly correlated with consumption of the good yesterday. Similarly, an excessively high BMI may also be the consequence of compulsive behaviour. A related, albeit slightly more subtle, issue which we consider here is the potential for these goods (cigarettes, alcohol and food) to reduce anxiety in some individuals. All three of these types of good are commonly associated, for some at least, with the (short-term) reduction of anxiety. If we consider any movement from the existing status quo as a shock – not just in the purely economic sense of an exogenous change in a variable which determines some type of behaviour – but in its more literal sense of a disturbing event, this raises the possibility that the effects of wage changes may have more than one component – an effect simply due to the size and direction of the variation (as formulated in the theoretical model above) and an effect due to the event of change in itself. Simply stated, preferences may, in some sense, be reference-dependent. This in turn implies the possibility at least that the effects of wage changes may be asymmetric around their current level. There is no reason to suppose *a priori* that positive and negative wage changes will have equal but opposite effects on consumption behaviour. We will return to this in our discussion of the results.

Consequently, we estimate equations of the form

$$z_{i,t} - z_{i,t-1} = f\left(\alpha + D_{\text{pos}}\beta\left(\ln\left(y_{i,t}\right) - \ln\left(y_{i,t-1}\right)\right) + D_{\text{neg}}\gamma\left(\ln\left(y_{i,t}\right) - \ln\left(y_{i,t-1}\right)\right)\right), \quad (7.22)$$

where z is the health-related indicator of interest and y is wage income; D_{pos} is a dummy taking value 1 if the change in income is positive and 0 otherwise, whilst D_{neg} conversely takes value 1 if the change in income is negative and 0 otherwise. The dummy thus allows us to distinguish between the effects of positive and negative income changes which, given the potentially dependence-creating nature of the types of behaviour under study, and more generally, the notion that some form of reference dependence may drive differential reactions to positive and negative income changes, we believe is likely to be important.

Using a differenced equation simplifies the analysis in that all the time-invariant variables drop out (thus, for example, excluding the need for individual fixed effects) and we can reasonably assume that the price differences over time are roughly constant across individuals, or at least of minor importance in determining the results. Using the log difference in wages as an explanatory variable implies that, since $\ln\left(y_{i,t}\right) - \ln\left(y_{i,t-1}\right)$ is approximately equal to the percentage change in the wage, the coefficient β measures the effect of wage changes in percentage terms.

Data

The empirical analysis employs data from of two waves of the British Cohort Study (BCS); a multiple-wave longitudinal survey-based study of people born in one week during April 1970. The BCS has collected a wide range of information on participants throughout their lives to date. We use data from the two waves undertaken at ages 26 and 29.

We consider the effects of the change in wage income for all those who were in dependent employment at both ages 26 and 29, the idea being to examine the effects of wage changes but to exclude from the analysis potentially traumatic events *per se* such as the complete loss of employment and its attendant effects on behaviour (and health) independent of the income effect in itself.

The dependent variables employed are concerned with two types of behaviour likely to negatively affect individuals' health, as well as one intermediate and one 'final' health-related outcome variable. Specifically, we consider the effects of wages changes on:

1. **Lifestyle/Behaviour**
   Given the dependency-creating nature of these behaviours we look at transitions out of and into the state of habitually indulging in them, looking at:
   (a) **Smoking** – The base variable uses a 1–0 dichotomy according to whether the person is a regular smoker at time x or not. Consequently,

in the dynamic (differenced) form this takes we estimate two probit models which estimate:

(i) the probability of starting to smoke between ages 26 and 29, given that the person is a non-smoker at age 26; and
(ii) the probability of stopping smoking between ages 26 and 29, given that the person is a smoker at age 26.

(b) Drinking – Here the base variable uses a 1–0 dichotomy according to whether the person is a regular drinker (i.e., whether the person drinks nearly every day). Again the dynamic form involves the estimation of two models which examine transitions from one state to another:

(i) the probability of becoming a regular drinker between ages 26 and 29, given that the person is not a regular drinker at age 26; and
(ii) the probability of stopping being a regular drinker between ages 26 and 29, given that the person is a regular drinker at age 26.

2. Health-related outcomes:

(a) Intermediate health indicator, BMI – Here ordinary least squares (OLS) is applied to (changes in) the BMI between age 26 and 29.

(b) Self-reported state of health – Based on a four-point scale ranging from 'excellent' (=1) to 'poor' (=4), an ordered probit model is estimated; in the dynamic (differenced) form, this is applied to the change in the self-reported state.

In each case a single explanatory variable, the (change in the) natural log of hourly wage rate of full-time employees, is employed. In a second stage, we also report the effects of wages on behaviour and health outcomes separately for young men and young women.

Results

Table 7.1 reports the results for smoking. The main results of interest are given in the first two columns which report the results of the dynamic model, whilst the third and fourth columns report the corresponding cross-section estimates. Note that the first column reports the value of β, the effect of the percentage wage change, given that it was positive. The second reports the value of γ; the difference between a negative and a positive wage change in terms of its 'impact' on the dependent variable. Although the effects are often not statistically significant in the differenced equation, the results suggest a consistently negative relation between smoking and income changes; wage changes are positively correlated with stopping smoking and negatively (and statistically significantly) correlated with starting smoking. In both cases, the effects of negative changes are stronger than positive ones, although the difference is not statistically significant in either case. One can also observe that the only statistically significant parameter in the dynamic model is the negative relation between increases in wages and starting smoking. *Ceteris paribus*, positive shifts in income are likely to discourage young people from starting smoking. It may also be noted in passing that columns 3 and 4 show the strong and statistically significant negative relation between wages and income at both ages 26 and 29. Hence in this case, all the effects, short- and long-run as well as both positive and negative wage change effects, are consistent.

However, if we look at the results of estimating the models separately by gender (Table 7.2), an interesting difference emerges between young men and young women: one can observe that the null effect of wages on giving up smoking is the sum of two opposing and statistically significant effects for males and females. Whilst a wage rise makes it more likely that a young man will stop smoking (or less likely that he will start if did not smoke at age 26), for young women a wage rise is actually associated with a reduced probability of giving up smoking. One might also observe that for a negative change in wages, the opposite, albeit not statistically significant, effect of wages is observed – a fall in wages is associated with a lower probability that a young woman will give up smoking. One might observe that although not significantly different from zero, the difference between the coefficients on positive and negative wage changes is statistically significant ($p < 0.05$) for young women; the implication is that positive and negative wage changes have different – opposing – effects on young women's decisions to give up smoking.

Table 7.1 Effects of wage changes on smoking, probit model

		Change in status 1996–9		*Cross-section 1996*	*Cross-section 1999*
		% Δ wage (positive)	*% Δ wage (negative)*	*ln(Wage)*	*ln(Wage)*
Stop (if smoker at 26)	Coeff.	0.03	0.54		
	Std. err.	0.16	0.48		
	n	951			
Mean of dependent variable:		0.275			
Start (if non-smoker at 26)	Coeff.	–0.28**	–0.37		
	Std. err.	0.14	0.25		
	n	3172			
Mean of dependent variable:		0.058			
Smoker (at 26 or 29)	Coeff.			–0.46***	–0.28***
	Std. err.			0.06	0.04
	n			4258	4612

Note: *** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$.

Table 7.2 Effects of wage changes on smoking, probit model, by gender

		Change in status 1996–9			
		Males		*Females*	
		% Δ wage (positive)	*% Δ wage (negative)*	*% Δ wage (positive)*	*% Δ wage (negative)*
Stop (if smoker at 26)	Coeff.	0.48**	0.34	–48**	0.73
	Std. err.	0.22	0.56	0.24	0.59
	n	524		427	
Mean of dependent variable:		0.250		0.307	
Start (if non-smoker at 26)	Coeff.	–0.53***	–0.45*	0.03	–0.33
	Std. err.	0.20	0.24	0.21	0.25
	n	1617		1555	
Mean of dependent variable:		0.066		0.050	

Note: *** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$.

The opposite sign for wage effects emerges even more strongly when it comes to drinking behaviour (Table 7.3). Looking first at the estimates of becoming a 'regular' (some might say 'heavy') drinker, both increases and decreases in the current wage lead to an increase in the probability of becoming a habitual drinker (given that the person was not one at age 26). Both of the effects are statistically significant (at at least the 10 per cent level) and, as would be expected given the opposite directions of the effects, so is the difference between the effects of positive and negative wage changes; it would appear that young people drink to celebrate their wage gains, but even more so to drown their sorrows associated with wage losses. Although weaker in terms of statistical significance, the effects are closely mirrored in the coefficient estimates concerned with stopping drinking; both wage gains and losses tend to reduce the likelihood of moderating one's drinking. This contrasts with the long-term relation, which is unequivocally positive. Clearly these results are not explainable in terms of the simple static neoclassical utility function outlined initially, and some modification to take into account some form of reference dependence, or indeed some other explanation, is needed as suggested above.

Once again there are clear differences across gender. In this case, the apparently inconsistent results (as far as the simple neoclassical model is concerned) are driven by the behaviour of young men (Table 7.4). For young men, both increased and decreased wages are associated with a greater likelihood of becoming a regular (heavy) drinker. It might be observed that, again for young men, stopping drinking also has the same apparent contradiction; in this case, however, the estimated parameters are not statistically significant, although the difference between them is. For young women, alcohol consumption demonstrates the more conventional demand characteristics of a normal good, with increases in wages being associated with drinking more and decreases associated with drinking less.

Table 7.3 Effects of wage changes on drinking, probit model

		Change in status 1996–9		*Cross-section 1996*	*Cross-section 1999*
		% Δ wage (positive)	*% Δ wage (negative)*	*ln(Wage)*	*ln(Wage)*
Stop being regular drinker (if one at 26)	Coeff.	–0.33*	0.46		
	Std. err.	0.20	0.45		
	n	450			
Mean of dependent variable:		0.398			
Become a regular drinker (if not one at 26)	Coeff.	0.28***	–0.66***		
	Std. err.	0.10	0.21		
	n	3673			
Mean of dependent variable:		0.099			
Regular drinker (at 26 or 29)	Coeff.			0.17**	0.24***
	Std. err.			0.07	0.04
	n			4215	4615

Note: *** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$.

Table 7.4 Effects of wage changes on drinking, probit model, by gender

		Change in status 1996–9			
		Males		*Females*	
		% Δ wage (positive)	*% Δ wage (negative)*	*% Δ wage (positive)*	*% Δ wage (negative)*
Stop being regular drinker (if one at 26)	Coeff.	–0.42	0.76	–0.26	–0.08
	Std. err.	0.27	0.80	0.24	0.59
	n	290		160	
Mean of dependent variable:		0.393		0.406	
Become a regular drinker (if not one at 26)	Coeff.	0.32**	–0.65***	0.17	0.09
	Std. err.	0.12	0.21	0.21	0.25
	n	1851		1822	
Mean of dependent variable:		0.120		0.076	

Note: *** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$.

Looking now more explicitly at health-related outcomes, Table 7.5 reports the results of an OLS regression of the change in BMI on wages. Whilst the cross-section results are clear and unequivocal – wages are negatively correlated with income – the relation between wage changes and BMI changes are weak and not statistically significant, although here too the sign of the wage effects changes according to whether the change is positive or negative. The results by gender also display moderately different characteristics by gender, BMI being positively associated with wages for young men and negatively for young women; however, none of these results are statistically significant and they are not reported here.

As regards the main outcome variable, self-reported health, the results are similar to, albeit clearer than, those for BMI (Table 7.6). Recall first that the scale used ranges from 1 (excellent health) to 4 (poor health), so that an increase in the scale reflects a worsening of an individual's health. Consequently, on the reasonable assumption that higher BMI (generally) implies a worsening of health,[4] the results in the table are immediately comparable to those for BMI – at least in terms of the direction of the effects. As before, in the cross-section estimates, wages are clearly positively related to (good) health. However, in the dynamic model, wage changes are only influential if they are negative when young men and young women are taken together; lower wages are associated with worse health. Increased wages appear to produce no beneficial effects on health, but wage falls

Table 7.5 Effects of wage changes on BMI, OLS estimation

BMI		*Dynamic model*		*Cross-section, 1996*	*Cross-section, 1999*
		% Δ wage (positive)	*% Δ wage (negative)*	*ln(Wage)*	*ln(Wage)*
BMI	Coeff.	.04	–.13	–.48***	–.25**
	Std. err.	.17	.29	.17	.12
	n	3201		3421	4456

Note: *** $p < .01$; ** $p < .05$; * $p < .10$.

Table 7.6 Effects of wage changes on self-reported health, ordered probit model

Health		*Dynamic model*		*cross section 1996*	*cross section 1999*
		% Δ wage (positive)	*% Δ wage (negative)*	*ln(Wage)*	*ln(Wage)*
Self-reported health	Coeff.	0.01	–0.28**	–0.36***	–0.16***
	Std. err.	0.08	0.14	0.05	0.03
	n	4107		4241	4614

Note: *** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$.

Table 7.7 Effects of wage changes on self-reported health, ordered probit model, by gender

		Males		*Females*	
		% Δ wage (positive)	*% Δ wage (negative)*	*% Δ wage (positive)*	*% Δ wage (negative)*
Self-reported health	Coeff.	–0.05	–0.34**	0.05	–0.23
	Std. err.	0.08	0.14	0.05	0.15
	n	2174		2229	

Note: *** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$.

lead to a worsening. Here, too, there is clear evidence of reference dependence worthy of further investigation.

Separating the sexes (Table 7.7), one finds that for both young men and young women negative income changes are associated with worsening health, although this is only statistically significant for young men.

Conclusions

In this paper we have proposed a simple model of health-related behaviour and subjected it to empirical testing using a detailed longitudinal database. Whilst the purpose is fairly limited, there are several findings of interest. First, there are major differences between the results of cross-section estimation and the differenced approach – as might have been expected. Throughout, the cross-section results suggest that health-related behaviour and, as a consequence, health itself are normal goods; wages are positively associated with behaviour likely to improve health – reducing drinking, stopping smoking and health itself measured in terms of (a lower) BMI and/or self-reported health status. The differenced model presented here, however, with its focus on transitory changes, makes it clear that the relationship between wages and health-related choices is not so straightforward. Indeed, the differenced model, which may more reasonably be considered as a causal relation between short-term wage changes and variations in health status or related behaviour, suggests that the simple neoclassical utility function considered in the first part of the chapter is not always adequate to capture the nature of these effects. Specifically, in the case of smoking and even more so in the case of drinking behaviour, the choices made are often not consistent with the simple static theoretical model presented at the outset.

A consideration of the effects separately by gender allows these apparently contradictory effects to emerge more clearly. Above all, there is very clear evidence that for alcohol consumption amongst young men, any reason is a good one to go out and get drunk. The probability of a young man becoming a regular (heavy) drinker increases if his income rises and also increases if his income falls.

How can such behaviour be explained? At least two fairly obvious possibilities present themselves. First, it may be that there is some form of reference dependence at the status quo; simply stated, there is a kink in the 'value' function at zero (corresponding to the status quo). A second possibility is that wage changes have more than one effect: an effect due to the magnitude and sign of the change in wages as in the standard utility-maximizing framework outlined above; and a second effect which arises due to the fact of change in itself – in this view, wage change may be viewed as a shock, not in the typical economic sense of an exogenous change in a variable influencing the values of other variables, but rather in its more normal meaning in the English language of a traumatic event. In this view, the change itself causes a trauma to the individual which can be 'treated' by recourse to greater consumption of alcohol or cigarettes. The second interpretation – itself a form of reference dependence, although not quite in the sense intended by Kahneman and Tversky (1979, 1991) – is given strength by the fact that cigarettes and alcohol are often considered, at least by regular users, to be goods which tend to reduce anxiety. To formalize such a proposition goes beyond the scope of this chapter; however, its existence suggests interesting areas for further research. One possibility would be to go back to Epicurus, considered one of the forerunners of modern utility theory, and his notion of 'static pleasure'. Although such speculation goes beyond our more limited purpose here, we believe that the peculiar relation between wage changes and behaviour identified here would clearly bear further study.

Acknowledgements

The authors are grateful for useful comments received from, in particular, Andrew Jones, as well as to participants in the Workshop on 'Youth and their Future: Work, Education and Health,' held at the University of Salerno, October 2013, the AIEL (Italian Association of Labour Economists) Conference and the SIEP (Italian Association of Public Economics) Conference both in September 2014. The usual disclaimers apply.

Notes

1 This approach may be considered as a generalization of Wagstaff's (1986) model. The Wagstaff model is a special case of this consumer model where $\beta = 0$ (good x is not in the consumer's utility function) and $\gamma = 0$ (z does not affect health). There are two main differences. First, in Wagstaff's model health can only be a normal good because $dh(x)/dy > 0$. In contrast, in the model proposed in this paper, health may be also an inferior good. Second, the level of health depends on the lifestyle of the consumer.

2 See, for example, the substantial body of research initiated by Becker *et al*. (1994) on rational addiction.

3 We do not wish to enter here into any discussion of the nature of dependence and, in particular, whether some individuals are more prone to becoming dependent on specific substances or behaviours and so on.

4 Although possibly a more appropriate model might consider both extremes of the BMI distribution, although the small numbers at the lower end of the distribution suggest that this would not make a great deal of difference to the results.

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8 Obesity and economic performance of young workers in Italy

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Introduction

It is a well-known fact that obesity is nowadays one of the most important public health concerns: obesity is a risk factor for numerous health problems and many chronic diseases, and its prevalence has increased by 10–40 percent in most European countries over the last decade (WHO, 2003). Moreover, obesity affects not only adults but also teenagers and children, especially in southern Europe (IOTF, 2002, 2003).

For all these reasons, it is important to assess both the determinants and the consequences of obesity. The effects of obesity on labor market outcomes for the USA have been established in a large number of studies. One of the most robust findings is that obese women tend to earn less than their non-obese counterparts and that there are differences by ethnicity and/or race (Cawley, 2000, 2004). Wage and occupational effects for men are less dramatic. The evidence available for Europe is overall consistent with what has been found for the USA, although the differences found among countries can be explained either by cultural factors or by the methodologies applied. One fundamental issuein this literature is the endogeneity of obesity. Obesity might lower wages by lowering productivity or because of workplace discrimination. But at the same time low wages might cause obesity because poorer people consume cheaper, more fattening foods. Moreover, unobserved variables might cause both obesity and low wages. This problem has been dealt with in many different ways in the literature, according to the information available and the estimation method applied.

In this chapter we present recent evidence for Italy, a country for which to our knowledge no previous analyses on obesity are available. Our approach is original in taking into account not only the usual quantitative measures for evaluating the labor market outcome of overweight people (wages and probability of having a job), but also a number of qualitative aspects that previously have not been considered.

We open up the analysis of the consequences of obesity for the labor market to a recent multidimensional perspective adopted by a number of international institutions – the United Nations Millennium Declaration, approved by the UN Assembly in September 2000; ILO, in its school-to-work transition survey, as explained in Elder (2009); the Lisbon Agenda, 2000; Eurofund (2007) and Eurofund (2012). Indeed, undertakings have been made not only to increase employment, but also to improve its quality. The question therefore arises as to whether obese workers can be discriminated against not only in terms of probability of being hired or in terms of wages but also for the quality of their jobs.

In this chapter we attempt to answer this question, focusing on the quality of jobs among young workers as reflected by their own perceived job satisfaction levels. In fact, although workers' job satisfaction has been widely analysed by sociologists and industrial psychologists, it also conveys useful information about economic life and labor market decisions that should not be ignored (Freeman, 1978; Eurofund, 2007).

Job satisfaction is a subjective measure of how people feel about their job. Broadly speaking, it can be thought of as a multidimensional construct involving subjective aspirations and objective opportunities. In this chapter we focus on so-called cognitive job satisfaction, which is the extent of the individual's satisfaction with particular aspects of their job, such as the work environment, organization of work time, duties, protection against sickness, accident and industrial injury, career perspectives, pay, competence and skills development, and job security.

Job satisfaction is useful not only as a proxy for job quality, but also for the following two reasons. First, it increases job productivity (Hamermesh, 1997) and therefore firm productivity (Oswald, 1997); and second, it improves social welfare, as it is extremely closely correlated to overall individual happiness and well-being (social life, family, etc.) (Addabbo and Solinas, 2012).[1]

For our analysis we use the 2006–2008–2010 panel data collected by the Institute for Workers' Professional Development (Istituto per lo Sviluppo della Formazione Professionale dei Lavoratori, ISFOL) in the Participation, Labour, Unemployment Survey (PLUS). This data set has a number of advantages for the purposes of our research: first, it is a panel survey, and as such it allows us to treat unobserved heterogeneity across workers, which is crucial when working with models of personal evaluation; second, it covers a time period that is subsequent to the introduction of labor market reforms meant to improve the labor market performance of young workers in Italy; third, it includes self-declared measures of height and weight, which allow the construction of the body mass index (BMI) to classify individuals as obese or not, as in most of the previous literature; and finally, it presents a unique wealth of information about self-declared satisfactions on an uncommonly large number of aspects of job satisfaction. More specifically, we observe nine dimensions of job satisfaction, whereas for other countries' data far fewer levels are available – for example, four in Green and Heywood (2011) and five in de Graaf-Zijl (2012). As a classical measure of labor market outcome we also consider wages.

Endogeneity of obesity could be an issue also in a job satisfaction model, although the reason why this may be so is less obvious than in a wage equation. It may be, for example, that latent individual traits affect the eating habits of an individual along with her/his well-being in the workplace. There could be also an inverse causality effect if bad conditions of work and low job satisfaction bring about a change in the diet for an individual. At this stage of the analysis, we do not pursue the endogeneity issue beyond an attempt to control for correlated latent heterogeneity.

Our findings are as follows. For young people in Italy there is never a wage penalty of obesity. Conversely, a job satisfaction effect of obesity clearly emerges and the aspects of their jobs with which obese men and women are dissatisfied are different.

The chapter is organized as follows. We begin by reviewing the existing literature on the consequences for the labor market of obesity, mainly in European countries. We then describe our data and present the econometric analysis, before offering some conclusions.

The literature

The analysis of the economic consequences of obesity in the labor market has quite a long history. Obesity is one way of measuring and taking into account the physical attractiveness of individuals considered for the first time in economics by Biddle and Hamermesh (1994, 1998). Since then, the empirical research has followed two different strands: one is to construct subjective measures of beauty, a concept that is difficult to quantify since it is exquisitely subjective; the other is to work with more objective measures of beauty, based on the observation of height, weight, fat mass, BMI, or other quantifiable aspects of perceived physical attractiveness.[2]

In this chapter we follow the second strand of the literature, and in this section we briefly survey the economic literature on obesity, with a focus on Europe.

The evidence about the economic consequences of obesity in Europe covers mainly the last decade and a limited number of countries: the UK (Sargent and Blanchflower, 1994; Morris, 2006); Germany (Cawley *et al*., 2005); Finland (Sarlio-Lahteenkorva and Lahelma, 1999)); Denmark (Greve, 2005)); and Germany (Caliendo and Gehrsitz, 2014). In Sargent and Blanchflower (1994), hourly earnings of women at age 23 are found to be lower conditioned on being obese at age 16, but no such relation is found for men. More recently, Morris (2005, 2006) shows that BMI has a positive and significant effect on mean hourly occupational earnings for males and a negative and significant effect for females, although the association for males is not robust across different specifications. However, after using the mean BMI (and/or the prevalence of obesity) across individuals living in the same health authority area as an instrument for individual BMI, he finds no statistically significant effect, either for men or for women. In Finland, obese females are found to have lower income levels than non-obese ones, but that is not the case for males (Sarlio-Lahteenkorva and Lahelma, 1999). The empirical evidence for Germany shows that obesity is negatively associated with wages, both for men and for women (Cawley *et al*., 2005). Finally, preliminary evidence for Denmark shows a negative effect of obesity and overweight on employment for women, while for men overweight seems to have a positive effect on employment (Greve, 2005).

On the other hand, there are some comparative studies across Europe based on the 1998–2001 waves of European Community Household Panel (ECHP) that find contrasting results according to the methodology of the analysis carried out. Villar and Quintana-Domeque (2006), Brunello and d'Hombres (2007) and Atella *et al*. (2008) analyze the effect of BMI on wages in Europe. With their descriptive evidence, Villar and Quintana-Domeque (2006) find overall no wage or gender effects in Europe; however, the heterogeneous correlations found across countries can be explained by cultural or institutional settings (collective bargaining coverage, provision of health insurance by employer, prevalence of obesity in the country, and social interactions). Brunello and d'Hombres (2007), pooling all the countries together, find that the association between BMI and wages is negative for women, and positive for men. Using BMI from biological family members as an instrument for individual BMI, they report a negative effect of BMI for both men and women and therefore no gender effect. Interestingly, Brunello and d'Hombres (2007) highlight a geographical effect: obese workers pay a wage penalty in 'olive belt' countries (Spain, Greece, Italy, Portugal) and earn a positive premium in 'beer belt' countries (Austria, Ireland, Denmark, Belgium, Finland). Controls for national GDP per capita and temperature seem to explain this evidence as follows: in warm countries obese people are less productive than in cold countries, and this explains their lower wages. On the same data Atella *et al*. (2008) apply an original method: quantile regression with instrumental variables. They also find high heterogeneity in Europe as the relationship between obesity and wages changes across countries and wage quantiles, but in their case cultural, environmental or institutional settings do not seem to be able to explain differences across countries. According to Atella *et al*. (2008), the observed differences across countries are therefore due to a pure discriminatory effect hypothesis.

Sousa (2005) and Villar and Quintana-Domeque (2006) focus on the probability of being employed for obese people. Sousa (2005) applies the propensity score technique (matching estimator) in order to assess the causal effect of BMI on the successful outcome in the labor market. Pooling all the countries together, she finds that the average treatment effect for those having a BMI above 25 decreases labor force participation for women, whereas it increases labor force participation for men. Villar and Quintana-Domeque (2006) find no employment or segregation effects with their descriptive analysis.

Finally, there is a recent study by Lundborg *et al*. (2007) carried out on the 2004 wave of the Survey of Health, Ageing and Retirement in Europe (SHARE) where the authors analyze the effect of obesity on employment, hours worked and hourly wages in 10 European countries for people aged 50 and above. Pooling all the countries together and using as birth order and the sibling sex composition of the respondent instrumental variables, they find that obesity is negatively associated with being employed for both men and women and with female hourly wages. They also observe heterogeneity across EU countries: the effects of obesity on employment are bigger for men in southern or central Europe, whereas the effects on wages are worse for women in central Europe.

The purpose of this chapter is to study this issue for Italy, focusing on young people. To our knowledge no previous studies for this country have been carried out.

The data

Our empirical analysis is based on micro-data collected by ISFOL in the Participation, Labour, Unemployment Survey (PLUS). In this survey, which started in 2005, a sample of about 38,000 working-age people are interviewed by telephone. Detailed personal data, information about education, family background, occupational characteristics and job search status are collected.[3]

In methodological terms, the representativeness of the sample follows exactly the same criteria as the national survey carried out by the Italian National Institute of Statistics (ISTAT): the Labour Force Survey (LFS). But the general purpose of the PLUS questionnaire is also to record people's self-perceptions about different aspects of their lives, and especially of their jobs, thereby completing the canonical information available in the LFS. In our analysis we use the longest 2006–2008–2010 panel version available for taking advantage of the longest working history of individuals. We focus on the population of young working people, selecting the sample of people aged between 15 and 35 years. The choice of this high upper bound for age is due to the evidence that in Italy exit from school and entrance into the labor market are often delayed, and hence the category of young workers is wider than in other countries. The sample does not include immigrants (identified as those without Italian citizenship) and those working for the armed forces. Table 8.1 reports some basic characteristics of the sample.

The ISFOL-PLUS is a balanced panel of 6,820 observations (38 percent men and 62 percent women). In 2010 the survey collected information about height and weight,[4] and also on some healthy behaviors of individuals such as playing sport and smoking. In particular, from height and weight we can calculate the BMI, defined a persons's weight in kilograms divided by the square of his/her height in metres (kg/m^2). Using the classification of the World Health Organization (WHO), we classify an individual as:

- overweight if his/her BMI is greater than 25 and less than 30;
- obese if his/her BMI is greater than or equal to 30.

Accordingly we generate the dummy *overweight,* which is unity when $25 < \text{BMI} < 30$ and the dummy obesity, which is unity when $\text{BMI} \geq 30$.

Table 8.1 shows some descriptive statistics both for the overall and the estimation sample of height, weight, and BMI. As we can see, men are on average taller and fatter than women, with a BMI of 23.59 versus 21.67 for women, and with 23 percent having $\text{BMI} > 25$ compared to 13 percent of women. Since we observe individual *weight* and *height* only for 2010, we have to restrict ourselves to this wave for estimation. As a result, more than half of our observations are lost in the estimation sample. Also, a small portion of this data loss is due to missing values in 2010. Interestingly, though, means and standard deviations in the estimation sample are very close to those of the complete sample, indicating that sample selection does not seem a serious concern for these data.

Table 8.1 Descriptive statistics for the ISFOL-PLUS 2006–2008–2010 panel

Total sample							*Estimation sample*					
	Males		*Females*		*Total*		*Males*		*Females*		*Total*	
	Freq.	*(%)*	*Freq.*	*(%)*	*Freq.*	*(%)*	*Freq.*	*(%)*	*Freq.*	*(%)*	*Freq.*	*(%)*
Observations	2,583	37.87	4,237	62.13	6,820	100	1168	40.2	1735	59.8	2903	100
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Height	178.07	6.76	164.84	6.41	169.85	9.16	177.98	6.88	164.87	6.30	170.15	9.17
Weight	74.88	11.28	58.91	10.19	64.95	13.13	75.35	11.15	58.62	10.11	65.35	13.36
BMI	23.59	3.13	21.67	3.46	22.39	3.46	23.77	3.12	21.55	3.45	22.44	3.50
BMI > 25	0.23	0.42	0.13	0.34	0.17	0.37	0.26	0.44	0.12	0.33	0.18	0.38

All the workers in the panel report their job satisfaction in each of the three years (2006, 2008, and 2010) both overall and in nine dimensions, available as answers to the following question: 'Overall, what is your level of satisfaction with respect to: (1) work environment (relationships with colleagues and superiors); (2) work organization (timetable, shifts, overtime, holidays); (3) duties; (4) content of job; (5) protection against sickness, accident, and industrial injury; (6) career perspectives; (7) pay; (8) competence and skills development; (9) job stability.' Responses are self-evaluations at four possible levels, which we have reordered homogeneously for increasing intensity as follows: low, medium-low, medium-high, high. The 'do not know' and 'not applicable' options have been eliminated from the sample.

As already remarked, we observe individual *weight* and *height* only for 2010, and so our empirical analysis is restricted to the 2010 wave of the ISFOL panel. Nonetheless, we try to exploit the panel information by including the group means of the time-varying explanatory variables also observed in the previous waves in order to model correlated unobserved heterogeneity. Then we use the available information on personal and family characteristics as explanatory variables. These variables comprise: sex, age, age squared, education (three groups – primary, secondary, and tertiary education), region of residence (four macro-areas – North-West, North-East, Centre, South and Islands), three type ofcontracts (permanent employment, temporary employment, other temporary arrangements introduced by the recent labor market reforms), occupation (three groups – high, medium, low skilled), sector of employment (five groups – agricultural, manufacturing, construction, trade and food, services) and a dummy variable that is unity if the individual has childfen, the number of family members and its square.

Gross annual earnings are computed by ISFOL in order to make the information on work income homogeneous across contracts. In fact, in the original data, workers report annual or monthly wages according to their type of contract. Unfortunately, due to the information available, no better homogeneous measures for labor earnings can be constructed.

Empirical analysis

Our research question concerns the effects of overweight and obesity on job satisfaction (overall and in the nine aspects of job satisfaction provided by the ISFOL panel data). We also implement a wage equation to evaluate their effects on job earnings. All models include the same control variables: personal and family characteristics and, to control for correlated latent heterogeneity, the group means of the explanatory variables that are both time-varying and observed over the three waves. Caution should be exercised in interpreting our estimation results as causal effects, though, since the group means can accommodate only the time-invariant latent heterogeneity components that are correlated with a subset of control variables that excludes *overweight* and *obesity.*

The estimation strategy is based on Van Praag's probit OLS estimator; see Praag and i Carbonell (2004, 2006) and, for an application to the ISFOL PLUS data, (Bruno *et al*, 2014). The estimation sample is of at most 2,903 individuals with 1,168 observations for males and 1,735 for females.[5]

Estimation results are presented in Tables 8.2–8.4. For each categorical variable we include the full set of dummies, excluding the reference category. So the reference individual has a permanent contract in the agricultural sector, is high skilled, lives in the North-West of the country, does not have children, has the lowest level of education, and is of normal weight. Table 8.2 reports the results for the regression model pooling males and females. It includes a gender dummy that is unity if the individual is a male. Tables 8.3 and 8.4 report results for the male and female subsamples, respectively.

Focusing on the results from the pooled model in Table 8.2, we observe that the two measures of excess body fat almost always have a negative impact, which is significant only in a few cases, however: overweight individuals have significantly lower satisfaction with organization of work time, while obese individuals are significantly dissatisfied with their career opportunities and development of skills.

It seems likely that the sporadic significant results in Table 8.2 may be the consequence of gender heterogeneity, and, indeed, looking at the separate male and female subsamples shows that this is the case. Results for men in Table 8.3 show that the set of satisfaction aspects where being overweight has a significantly negative impact, in addition to organization of work time, includes work environment, work duties, pay and skills. Obese men are significantly dissatisfied with development of skills and job stability only, and significantly satisfied with work duties, which is admittedly quite difficult to explain. From results in Table 8.4 we see that the being overweight is relatively less distressful for women than for men, while the reverse is true for obesity. Overweight women, in fact, are never significantly dissatisfied and, like obese men, are actually significantly satisfied with work duties. Obese women, however, are dissatisfied with work duties and career opportunities.

Overall job satisfaction is not affected by either obesity or overweight for all the samples considered.

Table 8.2 Aspects of job satisfaction, total sample, probit OLS estimates

Satisfaction	*Environment*	*Organisation*	*Duties*	*Content*	*Protection*	*Career*	*Pay*	*Skills*	*Stability*	*Overall*
Male	0.155*	0.0247	–0.00114	0.198**	0.0627	0.359***	0.270***	0.0994	0.271***	0.269***
	(0.0815)	(0.0883)	(0.0852)	(0.0908)	(0.0769)	(0.0818)	(0.0857)	(0.0889)	(0.0779)	(0.0935)
25 < BMI < 30	–0.0549	–0.192***	–0.00374	–0.0681	–0.0250	–0.123	–0.0882	–0.112	–0.0801	–0.0608
	(0.0765)	(0.0739)	(0.0829)	(0.0845)	(0.0709)	(0.0802)	(0.0788)	(0.0835)	(0.0726)	(0.0817)
BMI ≥ 30	–0.0975	–0.0134	–0.278	0.0317	–0.0782	–0.404***	–0.177	–0.228*	–0.163	–0.191
	(0.184)	(0.169)	(0.223)	(0.186)	(0.159)	(0.137)	(0.191)	(0.125)	(0.153)	(0.124)
Smoke	0.0865	0.189***	0.0806	0.183**	–0.00579	0.111*	0.113*	0.0741	0.104*	0.201***
	(0.0628)	(0.0666)	(0.0715)	(0.0720)	(0.0564)	(0.0626)	(0.0637)	(0.0595)	(0.0572)	(0.0657)
Age	7.347*	6.221	0.346	6.021	14.88***	0.659	–5.207*	–9.888***	1.144	–1.811
	(4.223)	(4.687)	(5.882)	(3.801)	(3.616)	(7.070)	(3.130)	(3.580)	(2.193)	(2.075)
Age squared	–0.134*	–0.112	0.00416	–0.112*	–0.268***	–0.0298	0.0660	0.160**	–0.0263	0.0307
	(0.0753)	(0.0844)	(0.104)	(0.0678)	(0.0643)	(0.125)	(0.0576)	(0.0648)	(0.0439)	(0.0407)
Children	0.847	4,719*	–5.529***	–2.981***	–5.171***	–832.1	–6.031***	–1,779	–0.0362	–0.509
	(0.701)	(2,754)	(1.171)	(0.624)	(0.485)	(2,518)	(0.579)	(2,298)	(0.572)	(0.557)
No. of family members	–0.0730	–0.195	0.137	–0.339	0.180	–0.313	0.130	–0.0372	0.0550	–0.254
	(0.208)	(0.211)	(0.238)	(0.215)	(0.183)	(0.241)	(0.225)	(0.257)	(0.183)	(0.223)
No. of family members squared	0.0149	0.0263	–0.0129	0.0549*	–0.0345	0.0366	–0.0285	–0.00770	–0.0182	0.0389
	(0.0321)	(0.0318)	(0.0367)	(0.0318)	(0.0271)	(0.0354)	(0.0341)	(0.0392)	(0.0279)	(0.0349)
Temporary employee	–0.257*	–0.360**	–0.124	–0.114	–0.0281	–0.119	–0.191	–0.0724	–0.562***	–0.178
	(0.136)	(0.141)	(0.147)	(0.144)	(0.121)	(0.135)	(0.123)	(0.131)	(0.102)	(0.153)
Temporary other arrangem.	–0.0492	–0.210	0.154	–0.0353	–0.435*	–0.469*	–0.443*	–0.160	–1.368***	–0.413*
	(0.212)	(0.243)	(0.249)	(0.276)	(0.238)	(0.256)	(0.231)	(0.293)	(0.232)	(0.213)
North-East	2.101***	–0.0899	1.019	1.975***	1.341***	–0.892	0.275	0.722	–0.216	0.0685
	(0.609)	(0.713)	(0.767)	(0.367)	(0.338)	(0.567)	(0.450)	(0.460)	(0.981)	(0.228)
Centre	0.499	1.262	0.824	0.574	0.270	–1.051	–0.648	0.447	–0.105	0.155
	(0.618)	(0.886)	(0.714)	(0.594)	(0.626)	(0.993)	(0.796)	(0.619)	(0.724)	(0.846)
South/Islands	0.707	1.002	1.081*	0.970**	–0.210	0.111	–0.0537	0.579	0.767*	0.502
	(0.489)	(0.663)	(0.634)	(0.393)	(0.566)	(0.410)	(0.391)	(0.368)	(0.434)	(0.859)

(*Continued*)

Table 8.2 (Continued)

Satisfaction	*Environment*	*Organisation*	*Duties*	*Content*	*Protection*	*Career*	*Pay*	*Skills*	*Stability*	*Overall*
Secondary education	–0.147	0.107	–0.0942	–0.174	–0.00907	0.231	0.0892	0.236**	0.275**	–0.0814
	(0.170)	(0.175)	(0.180)	(0.182)	(0.152)	(0.156)	(0.141)	(0.119)	(0.135)	(0.186)
Tertiary education	–0.0862	–0.00752	–0.255	–0.386*	–0.115	0.183	0.225	0.136	0.0401	–0.386*
	(0.217)	(0.217)	(0.225)	(0.229)	(0.196)	(0.200)	(0.188)	(0.188)	(0.193)	(0.215)
Medium skilled	0.00963	0.0272	–0.00645	–0.110*	0.0498	–0.128*	0.0521	–0.236***	0.0529	–0.0430
	(0.0571)	(0.0577)	(0.0637)	(0.0637)	(0.0640)	(0.0663)	(0.0629)	(0.0634)	(0.0538)	(0.0574)
Low skilled	–0.134	–0.0890	–0.0961	–0.316***	–0.0948	–0.367***	–0.127	–0.420***	0.0117	–0.408***
	(0.107)	(0.113)	(0.107)	(0.106)	(0.0944)	(0.106)	(0.102)	(0.108)	(0.0983)	(0.113)
Manufacturing	–0.0385	0.121	0.255	0.475***	0.118	0.434**	–0.224	0.0776	–0.183	–0.362
	(0.178)	(0.164)	(0.207)	(0.182)	(0.176)	(0.185)	(0.231)	(0.228)	(0.182)	(0.356)
Construction	0.0573	0.191	0.135	0.492**	–0.0562	0.849***	0.00171	0.198	–0.0233	–0.152
	(0.205)	(0.185)	(0.240)	(0.226)	(0.211)	(0.227)	(0.249)	(0.243)	(0.201)	(0.366)
Trade and food	–0.145	–0.0975	0.271	0.342*	–0.171	0.425**	–0.263	0.0491	0.0789	–0.321
	(0.171)	(0.153)	(0.206)	(0.181)	(0.174)	(0.185)	(0.225)	(0.225)	(0.165)	(0.337)
Services	–0.0779	0.0654	0.187	0.437**	–0.106	0.519***	–0.245	0.0833	0.0285	–0.298
	(0.166)	(0.138)	(0.201)	(0.174)	(0.170)	(0.177)	(0.223)	(0.224)	(0.163)	(0.340)
Constant	–12.23	–11.55	0.749	–11.21	–29.85***	–1.963	11.82*	19.14**	–0.595	6.535
	(8.550)	(9.457)	(11.82)	(7.770)	(7.411)	(14.19)	(6.550)	(7.467)	(4.686)	(4.509)
Observations	2,884	2,888	2,886	2,896	2,855	2,843	2,870	2,863	2,856	2,903
R^2	0.074	0.074	0.049	0.096	0.075	0.110	0.102	0.097	0.148	0.096

Number of family members (and its square) and age (and its square) are count variables. All the other regressors are binary indicators. The reference individual is a female of normal weight with a permanent contract in the agricultural sector, who lives in the North-West, does not have children, is high skilled and has the lowest level of education. The group means of the time-varying regressors observed over the three waves are included in all regressions (the corresponding coefficient estimates are not reported in the table). Robust standard errors in parentheses.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 8.3 Aspects of job satisfaction, male sample, probit OLS estimates

Satisfaction	*Environment*	*Organisation*	*Duties*	*Content*	*Protection*	*Career*	*Pay*	*Skills*	*Stability*	*Overall*
25 < BMI < 30	–0.155*	–0.245***	–0.174*	–0.107	–0.0803	–0.132	–0.177*	–0.216**	–0.0901	–0.0978
	(0.0925)	(0.0849)	(0.0988)	(0.0973)	(0.0869)	(0.107)	(0.0959)	(0.101)	(0.0845)	(0.101)
BMI ≥ 30	0.00577	0.283	0.463**	0.172	–0.291	–0.293	–0.236	–0.311**	–0.369*	–0.0830
	(0.221)	(0.197)	(0.223)	(0.175)	(0.240)	(0.179)	(0.362)	(0.144)	(0.203)	(0.175)
Smoke	0.157*	0.274***	0.203**	0.0713	–0.155*	0.110	0.0841	0.107	0.0315	0.151*
	(0.0879)	(0.0880)	(0.0989)	(0.0948)	(0.0801)	(0.0930)	(0.0844)	(0.0840)	(0.0784)	(0.0898)
Age	52.89***	41.36***	61.06***	46.04***	49.27***	–64.82***	31.28***	–39.64***	–0.252	12.49
	(9.410)	(10.15)	(10.58)	(9.368)	(8.172)	(10.43)	(9.616)	(9.983)	(8.809)	(10.05)
Age squared	–0.885***	–0.680***	–0.966***	–0.778***	–0.823***	1.034***	–0.522***	0.634***	0.00303	–0.204
	(0.152)	(0.164)	(0.171)	(0.151)	(0.132)	(0.168)	(0.155)	(0.160)	(0.142)	(0.162)
Children	–1.431***	–1.374	1.087	–0.274	0.692*	2.609	–1.318***	–0.632	–1.352***	–1.866***
	(0.396)	(1.499)	(1.588)	(0.402)	(0.366)	(2.092)	(0.393)	(1.921)	(0.327)	(0.511)
No. of family members	–0.357	–0.367	0.162	–0.412	0.312	–0.282	0.215	–0.121	0.0221	–0.371
	(0.299)	(0.301)	(0.340)	(0.318)	(0.266)	(0.355)	(0.323)	(0.337)	(0.267)	(0.337)
No. of family members squared	0.0549	0.0686	–0.0204	0.0830*	–0.0515	0.0381	–0.0450	–0.00506	–0.0122	0.0600
	(0.0497)	(0.0481)	(0.0569)	(0.0497)	(0.0411)	(0.0545)	(0.0542)	(0.0564)	(0.0440)	(0.0563)
Temporary employee	–0.203	–0.452**	–0.101	–0.251	–0.0655	–0.106	–0.386**	–0.154	–0.464***	–0.139
	(0.218)	(0.218)	(0.241)	(0.236)	(0.168)	(0.214)	(0.176)	(0.196)	(0.149)	(0.229)
Temporary other arrangem.	0.205	0.103	0.479	0.0481	–0.0630	–0.0165	–0.316	0.238	–1.776***	–0.0301
	(0.250)	(0.303)	(0.345)	(0.430)	(0.331)	(0.416)	(0.372)	(0.466)	(0.307)	(0.297)
North-East	1.406	–1.123	–2.003	3.317***	0.201	–1.815	–1.441	1.706	–2.893*	0.273
	(1.486)	(0.848)	(1.633)	(0.727)	(0.922)	(1.442)	(1.525)	(1.512)	(1.517)	(0.586)
Centre	–1.563	–0.0708	–0.851	–0.138	–0.616	–1.863***	–1.556	0.266	–1.875*	0.311
	(1.031)	(1.000)	(1.322)	(1.448)	(1.087)	(0.649)	(0.981)	(1.328)	(1.035)	(1.010)
South/Islands	0.739	2.267***	2.162***	1.569***	0.144	0.536	0.0327	0.756	1.651***	1.712
	(0.704)	(0.679)	(0.724)	(0.547)	(1.137)	(0.586)	(0.706)	(0.560)	(0.297)	(1.227)

(*Continued*)

Table 8.3 (Continued)

Satisfaction	*Environment*	*Organisation*	*Duties*	*Content*	*Protection*	*Career*	*Pay*	*Skills*	*Stability*	*Overall*
Secondary education	–0.141	0.208	–0.0163	–0.163	0.0314	0.394*	0.221	0.184	0.161	–0.315
	(0.224)	(0.234)	(0.245)	(0.241)	(0.188)	(0.214)	(0.189)	(0.148)	(0.171)	(0.222)
Tertiary education	–0.0462	0.252	–0.0861	–0.376	0.131	0.322	0.657**	0.0496	0.227	–0.526*
	(0.354)	(0.319)	(0.354)	(0.353)	(0.297)	(0.291)	(0.257)	(0.312)	(0.274)	(0.295)
Medium skilled	0.0960	0.0644	0.0960	0.00800	–0.124	–0.123	0.0290	–0.172*	0.103	–0.0133
	(0.0906)	(0.0854)	(0.0993)	(0.0980)	(0.0951)	(0.107)	(0.0958)	(0.0981)	(0.0750)	(0.0942)
Low skilled	–0.159	–0.0584	–0.0849	–0.324**	–0.317***	–0.554***	–0.222**	–0.406***	0.141	–0.438***
	(0.125)	(0.125)	(0.139)	(0.136)	(0.107)	(0.128)	(0.112)	(0.123)	(0.112)	(0.131)
Manufacturing	0.000516	0.194	0.0957	0.306	–0.00554	0.406	–0.385	–0.0769	0.213	–0.411
	(0.267)	(0.196)	(0.268)	(0.243)	(0.259)	(0.253)	(0.290)	(0.304)	(0.168)	(0.317)
Construction	–0.00808	0.184	–0.0610	0.225	–0.310	0.715**	–0.251	0.0251	0.179	–0.367
	(0.293)	(0.241)	(0.297)	(0.288)	(0.292)	(0.295)	(0.304)	(0.315)	(0.214)	(0.339)
Trade and food	–0.289	–0.114	0.0612	0.103	–0.296	0.336	–0.439	–0.0605	0.413**	–0.492
	(0.262)	(0.215)	(0.266)	(0.242)	(0.263)	(0.273)	(0.292)	(0.305)	(0.165)	(0.309)
Services	–0.157	0.0913	–0.0218	0.185	–0.238	0.468*	–0.460	–0.0398	0.364**	–0.401
	(0.269)	(0.193)	(0.268)	(0.246)	(0.259)	(0.259)	(0.285)	(0.303)	(0.159)	(0.316)
Constant	–101.8***	–82.32***	–119.2***	–88.47***	–96.03***	125.9***	–61.56***	76.90***	1.599	–21.43
	(18.11)	(19.51)	(20.31)	(17.97)	(16.20)	(19.98)	(18.44)	(19.35)	(17.26)	(19.35)
Observations	1,163	1,160	1,164	1,166	1,150	1,152	1,157	1,153	1,147	1,168
R^2	0.119	0.133	0.104	0.132	0.102	0.131	0.155	0.155	0.217	0.124

Number of family components (and its square) and age (and its square) are count variables. All the other regressors are binary indicators. The reference individual is of normal weight, has a permanent contract in the agricultural sector, is high skilled, lives in the North-West, does not have children, and has the lowest level of education. The group means of the time-varying regressors observed over the three waves are included in all regressions (the corresponding coefficient estimates are not reported in the table). Robust standard errors in parentheses.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 8.4 Aspects of job satisfaction, female sample, probit OLS estimates

Satisfaction	*Environment*	*Organisation*	*Duties*	*Content*	*Protection*	*Career*	*Pay*	*Skills*	*Stability*	*Overall*
25 < BMI < 30	0.0793	–0.0456	0.262**	0.0152	0.0726	–0.155	0.0495	0.156	–0.0598	0.000607
	(0.128)	(0.132)	(0.116)	(0.127)	(0.106)	(0.103)	(0.123)	(0.121)	(0.112)	(0.105)
BMI ≥ 30	–0.134	–0.211	–0.696***	–0.0284	0.0157	–0.543***	–0.0868	–0.0652	0.0823	–0.220
	(0.268)	(0.229)	(0.239)	(0.300)	(0.206)	(0.207)	(0.234)	(0.200)	(0.187)	(0.157)
Smoke	0.0447	0.0966	–0.0130	0.278***	0.133*	0.0541	0.106	0.0737	0.135*	0.209***
	(0.0808)	(0.0888)	(0.0781)	(0.0829)	(0.0782)	(0.0781)	(0.0828)	(0.0796)	(0.0751)	(0.0698)
Age	–	–	–	–	–	–	–	–	–	–
Age squared	0.00664	–0.000526	–0.00161	0.00287	0.0276***	–0.000939	–0.0412***	–0.0342***	0.00127	–0.00697
	(0.00437)	(0.00438)	(0.00433)	(0.00431)	(0.00422)	(0.00429)	(0.00439)	(0.00406)	(0.00418)	(0.00448)
Children	–2.310***	4,060	1.216**	–231.9	–4.591***	–281.3	–4.953***	–4.151***	2.215***	0.231
	(0.531)	(7,922)	(0.514)	(8,014)	(0.502)	(6,861)	(0.510)	(0.485)	(0.501)	(0.448)
No. of family members	0.387*	–0.0527	0.236	–0.240	0.112	–0.323	0.0508	0.224	0.228	–0.0316
	(0.211)	(0.219)	(0.251)	(0.227)	(0.207)	(0.200)	(0.212)	(0.185)	(0.200)	(0.177)
No. of family members squared	–0.0509*	–0.00628	–0.0241	0.0197	–0.0241	0.0311	–0.0188	–0.0328	–0.0442	–0.00245
	(0.0303)	(0.0313)	(0.0355)	(0.0316)	(0.0288)	(0.0290)	(0.0297)	(0.0262)	(0.0281)	(0.0262)
Temporary employee	–0.293**	–0.192	–0.0636	0.126	0.147	–0.0773	0.0406	0.0565	–0.743***	–0.268**
	(0.143)	(0.168)	(0.144)	(0.130)	(0.152)	(0.143)	(0.154)	(0.157)	(0.143)	(0.133)
Temporary other arrangem.	–0.396	–0.529	–0.0768	–0.160	–0.565**	–0.942***	–0.568**	–0.410	–1.116***	–0.811***
	(0.321)	(0.340)	(0.288)	(0.344)	(0.280)	(0.301)	(0.273)	(0.302)	(0.324)	(0.291)
North-East	2.379***	0.0773	1.362***	1.271***	1.471***	–0.635	0.657**	0.508	0.419	–0.291
	(0.454)	(0.937)	(0.475)	(0.251)	(0.470)	(0.609)	(0.256)	(0.350)	(0.822)	(0.238)
Centre	1.138*	0.543	0.443	0.197	0.559	–1.095	–0.110	0.908	–0.270	–0.566
	(0.674)	(0.698)	(0.470)	(0.471)	(0.600)	(1.244)	(0.882)	(0.708)	(0.888)	(0.533)
South/Islands	0.799	–0.0451	0.134	0.795**	–0.315	0.106	0.228	0.562	0.127	–0.497
	(0.673)	(0.542)	(0.370)	(0.353)	(0.496)	(0.528)	(0.465)	(0.527)	(0.584)	(0.409)

(*Continued*)

Table 8.4 (Continued)

Satisfaction	*Environment*	*Organisation*	*Duties*	*Content*	*Protection*	*Career*	*Pay*	*Skills*	*Stability*	*Overall*
Secondary	–0.0326	0.0402	–0.207	0.0292	–0.0365	0.0625	–0.0663	0.405**	0.442*	0.469**
education	(0.188)	(0.233)	(0.206)	(0.195)	(0.221)	(0.210)	(0.221)	(0.201)	(0.239)	(0.237)
Tertiary	–0.0203	–0.192	–0.467*	–0.231	–0.292	–0.0135	–0.251	0.241	–0.0119	0.0647
education	(0.234)	(0.274)	(0.263)	(0.256)	(0.257)	(0.270)	(0.292)	(0.250)	(0.302)	(0.281)
Medium skilled	–0.0887	–0.00850	–0.0707	–0.236***	0.209***	–0.146**	0.0466	–0.326***	–0.0268	–0.107*
	(0.0698)	(0.0723)	(0.0725)	(0.0731)	(0.0780)	(0.0722)	(0.0727)	(0.0754)	(0.0726)	(0.0643)
Low skilled	0.0149	0.0298	0.0129	–0.162	0.155	–0.0833	–0.126	–0.366*	–0.335*	–0.446**
	(0.189)	(0.240)	(0.162)	(0.174)	(0.177)	(0.183)	(0.201)	(0.193)	(0.181)	(0.176)
Manufacturing	–0.190	–0.261	0.501	0.855***	0.197	0.606**	0.118	0.462	–0.298	0.0901
	(0.219)	(0.261)	(0.324)	(0.266)	(0.296)	(0.253)	(0.259)	(0.312)	(0.308)	(0.360)
Construction	0.468*	0.103	0.860*	1.351***	0.914***	1.529***	0.633*	0.930**	0.207	0.716*
	(0.239)	(0.314)	(0.458)	(0.377)	(0.337)	(0.350)	(0.330)	(0.429)	(0.357)	(0.396)
Trade and food	0.00680	–0.252	0.542*	0.841***	–0.00729	0.693***	0.0754	0.312	0.0327	0.265
	(0.186)	(0.198)	(0.321)	(0.254)	(0.284)	(0.242)	(0.243)	(0.310)	(0.293)	(0.341)
Services	0.00707	–0.122	0.453	0.914***	0.0749	0.760***	0.102	0.346	–0.0196	0.252
	(0.170)	(0.177)	(0.316)	(0.248)	(0.276)	(0.237)	(0.240)	(0.313)	(0.302)	(0.336)
Constant	1.486	1.766	0.226	–1.541	–2.790	1.724	3.364	0.274	2.662	2.539
	(1.954)	(1.995)	(2.020)	(1.968)	(2.084)	(2.142)	(2.134)	(2.250)	(1.845)	(1.867)
Observations	1,721	1,728	1,722	1,730	1,705	1,691	1,713	1,710	1,709	1,735
R^2	0.098	0.090	0.109	0.148	0.125	0.122	0.135	0.117	0.181	0.179

See the notes to Table 8.3. Robust standard errors in parentheses.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 8.5 Gross income (logs), OLS estimates

Variables	*Total sample*	*Males*	*Females*
25 < BMI < 30	0.0440	0.0433	0.0240
	(0.0284)	(0.0333)	(0.0513)
BMI ≥ 30	0.0149	–0.0293	0.0633
	(0.0661)	(0.0577)	(0.113)
Smoke	0.0212	0.00290	0.0314
	(0.0263)	(0.0372)	(0.0416)
Age	–1.971**	–8.095**	
	(0.968)	(3.725)	
Age squared	0.0272	0.128**	–0.0122***
	(0.0181)	(0.0600)	(0.00236)
Children	–0.176	0.225	–2,862
	(0.266)	(0.166)	(4,350)
No. of family members	–0.0876	–0.0674	–0.170*
	(0.0712)	(0.107)	(0.0948)
No. of family members squared	0.0139	0.0151	0.0186
	(0.0112)	(0.0179)	(0.0135)
Temporary employee	–0.0126	–0.0389	0.00376
	(0.0531)	(0.0578)	(0.0970)
Temporary other arrangem.	–0.0783	–0.139	–0.0845
	(0.125)	(0.171)	(0.198)
North-East	–0.400**	–0.161	–0.530***
	(0.168)	(0.502)	(0.137)
Centre	–0.431	0.0864	–0.530
	(0.301)	(0.343)	(0.385)
South/Islands	–0.343**	–0.386***	–0.163
	(0.154)	(0.142)	(0.265)
Secondary education	0.00399	–0.0830	0.161
	(0.0672)	(0.0813)	(0.116)
Tertiarye ducation	–0.0727	–0.170	0.106
	(0.103)	(0.133)	(0.163)
Medium skilled	–0.0104	0.0355	–0.0742*
	(0.0287)	(0.0463)	(0.0394)
Low skilled	0.00623	0.0685	–0.174*
	(0.0413)	(0.0492)	(0.0982)
Manufacturing	0.0203	–0.0147	0.0862
	(0.0573)	(0.0621)	(0.121)
Construction	–0.00631	–0.0415	–0.0467
	(0.0744)	(0.0804)	(0.157)
Trade and food	–0.106*	–0.141**	–0.0958
	(0.0582)	(0.0673)	(0.115)
Services	–0.0532	–0.0306	–0.111
	(0.0560)	(0.0597)	(0.112)
Male	0.227***		
	(0.0380)		
Constant	11.75***	23.74***	8.503***
	(2.109)	(7.264)	(0.954)
Observations	2,919	1,175	1,744
R^2	0.207	0.240	0.157

See the notes to Tables 8.2 and 8.3.Robust standard errors in parentheses.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Heterogeneity between males and females is also observed for the impact on satisfaction of another unhealthy behavior: smoking. Smoking almost always has a positive impact on satisfaction for men, which is significant in the cases of satisfaction with work environment, organization of work time, work duties and overall job satisfaction. There is the exception of a significantly negative impact of smoking on the satisfaction with job safety (protection). For females smoking never has a significantly negative satisfaction impact. It has a significantly positive impact in the cases of satisfaction with job content, job safety, job stability and overall job satisfaction.

Having children has an ambiguous effect on the different aspects of job satisfaction, but it is more often significant and sizeable for women than for men. There is the notable exception, however, of a significantly negative overall impact of job satisfaction for men where in contrast the same coefficient is non-significant for women. Low-skilled males are significantly less satisfied than both high- and medium-skilled across many aspects of job satisfactions. Medium-skilled females are often less satisfied than high-skilled, with the statistically significant exception of satisfaction with job safety. Coherently with what was found in Bruno *et al.* (2014), temporary workers are less satisfied than permanent workers. Sector of employment does not seem to play a role in most aspects of men's job satisfaction. However, female agricultural workers are the least satisfied with the two aspects of job content and career. Moreover, we do observe some regional effects, but not important education effects.

We have also investigated the impact of the overweight and obesity variables on gross income using the same set of controls and on the same samples as in the satisfaction equations. Results for these exercises are reported in Table 8.5 and consistently show non-significant effects for all the samples considered.

Conclusions

In this chapter we have analysed empirically the relationship between measures of excess body fat (overweight and obesity) and labor market outcomes for young workers in Italy using the ISFOL-PLUS 2006–2008–2010 panel data. For the first time we have considered in particular as a measure of labor market outcome the quality of jobs evaluated through self-reported assessments of job satisfaction.

For our nine aspects of job satisfaction we have found a general negative relationship between, on the one hand, obesity and overweight and, on the other, aspects of job satisfaction, with significant gender differences both about which is the most distressful condition, overweight or obesity, and about the aspects of job satisfaction that are most affected. While for men being overweight is the most distressful condition, for women it is obesity. So, overweight men are dissatisfied over work environment, organization of work time, pay, and development of skills, while obese females are dissatisfied with work duties and career opportunities. Obese men are only dissatisfied with development of skills and job stability, and overweight women are not dissatisfied at all. There is the interesting, although hard to explain, result that obese men and overweight women are more satisfied than their normal-weight counterparts with the burden of work duties. Overall job satisfaction is not affected by either obesity or overweight in either subsample. Similarly, the analysis on the gross-income effect of overweight and obesity does not yield significant results.

On a methodological note, from all the above findings we gather that considering aspects of job satisfaction as measures of labor market outcome significantly improves the analysis of the labor market consequences of obesity. Limiting the analysis to labor earnings, or also to overall job satisfaction, would have not uncovered any effect of a high BMI for Italian young workers. But some important effects are there, and become evident when the focus shifts to specific aspects of job satisfaction. Also the distinction between overweight and obesity seem relevant, as is that between young men and women.

If, according to the recent European directions, jobs of good quality should be the aim in all countries, the analysis of the Italian case shows that attention should be given to the problem of obesity for young people, although further research is needed for exploring the causal relationship between BMI and labor market outcomes.

Notes

1 For other analyses of job satisfaction, in particular related to contractual characteristics of workers, see, for example, Van Praag and Ferrer-i-Carbonell, 2004, for Germany; de Graaf-Zijl (2012) for the Netherlands; Booth *et al*. (2002), Bardasi and Francesconi (2004) and Green and Heywood (2011) for the UK; Bruno *et al*. 2014 for Italy.
2 For a recent analysis of the relationship between subjective and anthropometric measures of attractiveness, see Oreffice and Quintana-Domenque (2014).
3 For a complete description of the survey, see Mandrone (2012).
4 Height and weight are self-reported, and as such (see Danubio *et al*., 2008) can lead to misclassification of the prevalence of obesity since the participants overestimate or underestimate height, weight and/or both, and such misclassification varies according to gender and age.
5 The estimation sample varies slightly depending on the satisfaction variable. The actual sample sizes are reported in the tables.

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9 Leaving home and housing prices

The experience of Italian youth emancipation

Francesca Modena and Concetta Rondinelli

Introduction

In recent years house prices have more than doubled in the largest Italian cities (Panetta *et al*. 2009), and similar developments have been recorded in other European countries, with the exception of Germany. Developments in residential property prices are an important factor in monetary policy decisions aimed at maintaining price stability in the euro area over the medium term. The recent global crisis had its main origin in the financial and real estate sector, so that developments in housing markets should be kept under control because of their potential disruptive impact on financial stability and the real economy (Campbell *et al*. 2009; Panetta *et al*. 2009; Muzzicato *et al*. 2008; Leamer 2007).

Changes in house prices may also affect residential investment, with non-negligible effects on the credit market. Households' consumption attitudes (wealth effects) are thus shaped by the dynamics in the real estate market, as they might have severe distributional implications. Sharp increases in housing costs are found to lead to a postponement of youth emancipation decisions (Haurin *et al*. 1993, 1997; Ermisch and Di Salvo 1997; Ermisch 1999), to discourage labour mobility choices (Bentolila and Dolado 1991; Cannari *et al*. 2000), and to reduce the total fertility rate (Kohler *et al*. 2002).

The analysis of Italian youth emancipation is particularly interesting because Italians leave home relatively late compared to their counterparts in other countries. The late transition to adulthood relates to both cultural and economic factors, the latter prevailing in recent years. Economic circumstances have changed significantly in Italy over the past two decades. Besides sluggish growth, Italy has been characterized by various reforms of the labour market and the pension system, and a sharp increase in both house prices and rents. Moreover, the Italian welfare system is weak, with an exclusive role of the original family in supporting young people in this transition (Iacovou 2002; Mencarini and Tanturri 2006). Another key issue distinguishes the Italian context: the special features of the dwelling market. About 70 per cent of Italian families own their homes, while the share of renters amounts to about 20 per cent. Additionally, the high cost of rental housing prevents many youths from leaving the parental home and induces a sort of selection effect which sorts young and lower-income individuals out of the rental market.

Several studies explore the determinants of Italian youth's decision to leave the parental home, but none of them focus on housing prices. While we do not rule out the importance of other factors, in this chapter we concentrate on the role played by house prices and rents on coresidence decisions of young Italians. The empirical analysis is conducted using the panel component of the Survey on Household Income and Wealth (SHIW) carried out by the Bank of Italy. By assembling a unique database on housing and rental levels, based on a semiannual survey conducted for a special review published by the Il Sole 24 Ore media group (Consulente Immobiliare, CI) on the largest Italian municipalities from 1989 to 2008, we match the SHIW household sample with the real estate market using the municipality where the house (owned or rented) is located. As a major contribution of the chapter, our analysis is based on a detailed database of house and rent prices obtained from the market value instead of the amount declared by the households interviewed. We find that higher housing prices and rents decrease the probability of residing outside parental home, the former for both sexes, the latter for females. Our results also point up the joint effect of labour market conditions and housing costs on emancipation decisions: on the one hand, an increase in house prices postpones home leaving decisions for employed youths and unemployed females; on the other, the effect of the real estate market on high-income households is negligible. Cohort effects are at work, shaping the transition to adult age for those born between 1976 and 1982.

The chapter is organized as follows. After summarizing the main determinants of home leaving decisions and reviewing the literature on housing costs and youth emancipation, we underline the main features of Italian adulthood and describe the evolution of the real estate market. We then present the data and methodology adopted. We summarize our results and present our conclusions.

Determinants of home leaving decisions

The transition to adulthood is a complex process in which youths who have been dependent on parents throughout their childhood start taking definitive steps to achieve measures of financial, residential and emotional independence, and to take on more adult roles as citizens, spouses, parents and workers (Ribar 2015). The pattern of leaving the parental home has been proved to vary with the welfare system (Aassve *et al*. 2002) and to be positively related to employment and income for the countries of southern Europe.

The postponement of youth emancipation has a long tradition in Italy. In 1983, 49 per cent of young people aged 18–34 lived in the parental home; in 2009, the percentage of coresident children was 59 per cent, among whom 43 per cent were employed (Istat 2010). Most children stayed at home until the age of 24, the percentage being non-negligible for older cohorts: 59 per cent for the group aged 25–29 (69 per cent for males and 49 per cent for females), and 29 per cent for those aged 30–34 (30 per cent for males and 20 per cent for females) (Istat 2010). This phenomenon is common to countries in southern Europe and depends on both cultural aspects and the role played by the family in these welfare systems. More recent data published by the Italian National Institute of Statistics suggest that something has changed in the Italian context. The percentage of people citing economic conditions as the main reason for staying at home has increased (34 per cent in 2003 and 40 per cent in 2009) owing to the difficulty of finding a suitable dwelling and a job. As a consequence, the transition to adulthood is becoming less a result of individual choices and more a compromise between a growing desire for independence and the need for protection against the poverty risk (Istat 2010).

The choice of leaving the parental home depends on both the cost of independent living and the individual's ability to pay that cost (Haurin *et al*. 1997). During the 1990s house and rent prices increased substantially, with major changes in the institutional Italian labour market. The abolition of wage indexation, reform of the collective bargaining system, and the introduction of atypical labour contracts initiated a long period of wage moderation and increased job insecurity: mean earnings declined over the period 1986–2004 (Rosolia 2009), with a reduction in entry wages not offset by a faster subsequent wage growth (Rosolia and Torrini 2007). These changes gave rise to a segmentation of the labour market whereby an increasing proportion of young workers had low incomes, inadequate social protection, and discontinuous careers; they also contributed to an increase in the number of older workers enjoying higher wages, greater job security, and better opportunities for promotion (Brandolini 2009; Cipollone 2001). The recent economic crisis amplified the difficulties for young cohorts: in 2009 the youth unemployment rate (15–24) was about 25 per cent (Istat 2010), with increasing disadvantages for the younger cohorts in receiving future pension benefits. The combination of these institutional and market changes has had serious negative consequences for the younger generation in Italy (Berloffa and Villa 2010): young people are more dependent on their parents' resources and tend to postpone emancipation choices (delay in family formation and fertility decisions), with clear consequences for the present and future well-being of society.

The postponement of Italian youth emancipation is thus the product of both cultural and structural changes (Facchini and Villa 2005), the latter prevailing in recent years owing to significant losses of income levels by younger cohorts.

Housing costs and youth emancipation

The role of labour market on home leaving in Italy has been analysed by many studies, which show that being employed and having a higher income increases the probability of residing outside the parental home (Aassve *et al*. 2001, 2002; Mazzucco *et al*. 2006; Mencarini and Tanturri 2006; Ayllón 2015). The role of housing prices in youth emancipation has received less attention and the results cover a wide range, depending on the country studied.

Ermisch and Di Salvo (1997) showed that in the UK higher house prices can affect the postponement of home leaving for women, but have an ambiguous effect for men; for both, house prices discourage the formation of partnerships. In a subsequent work Ermisch (1999) confirmed the negative effects of higher house prices on home leaving and partnership formation and found that they also encourage returns to the parental home. A similar study on the USA (Haurin *et al*.

1993) indicates that higher rental costs are associated with a higher probability that American youths will remain in the parental home or live in a group. Using Australian data, Haurin *et al*. (1997) found slightly different results: rental costs have a significant negative impact on the decision to reside alone versus group residence, but they have no significant effect on the probability of leaving the parental home.

The relation between housing costs and Italian youth emancipation has been studied much less. Some authors include housing costs among the controls, but they focus on different explanations for the high rates of coresidence among young Italians. Giannelli and Monfardini (2003), for example, analyse the effects of expected earnings and local market conditions on the behaviour of young adults with high school diplomas, and they jointly model the decision to leave the parental home and the decision to work or study. Housing costs are constructed as the ratio of the housing cost index (which includes rents, water, maintenance and repair of domestic equipment) to the consumer price index, using Istat data. They find that a 10 per cent increase in housing costs reduces the propensity to leave the parental home by the same proportion. Becker *et al*. (2010) test whether the job insecurity of parents and children affects children's moving-out decisions. The microeconomic analysis for Italy, conducted using the 1995 wave of SHIW, includes the home rental index in the province as a control variable, and it finds no impact of rental prices on young emancipation.

The aim of this chapter is to bridge the gap in the literature by focusing on both house prices and rents as key determinants of young home leaving choices. The main feature of this work is that it uses detailed data on the market value of house prices and rents, instead of the amount declared by the interviewed household. We first assemble a unique database related to market values, by using an external source, and we then match house and rent prices with the household characteristics based on residential province. We estimate a discrete time duration model on the decision to leave home in a given year conditioned on a set of observed characteristics.

The Italian setting

Features of Italian emancipation

Several features characterize the transition to adulthood in Italy: the link between marriage and emancipation; the beginning of working life in the parental home; the strong incidence of homeowners; and the increasing dependency of young people on their parents. A highly traditional sequence of events characterizes the Italian setting: the end of education, a stable job, and leaving home for marriage or cohabitation (Mazzucco *et al*. 2006). The SHIW sample confirms this evidence, as on average 6 years pass between the first experience of work and leaving home: there are regional differences, with young people in the South staying at home for 4½ years after the first experience of work. The formation of a new household or marriage is the main reason for leaving home, in particular for women and older cohorts.[1]

Italian families prefer to own rather than rent their homes, as documented by the high proportion of homeowners. The share of homeowners has increased over time (62.7 per cent in 1989, 69.4 per cent in 2008 in the SHIW), varying significantly by age, occupation status of the head of household and by the household's wealth. The owner-occupancy rate at age 35 or less is already high, about 48 per cent in 2008, increasing as age grows. The rent option, on the other hand, has risen over the past two decades only at younger ages, 30 or less, and for employees. The relationship between the rent option and poor economic conditions has grown stronger in recent decades (D'Alessio and Gambacorta 2007).

Another feature of Italian emancipation is the increasing role of family background. In the SHIW, in 2008, about 30 per cent of homeowners had inherited the home or received it as a gift (in 1989 the percentage was 26 per cent).[2] Paradoxically, in the absence of housing policy providing social rented housing and/or subsidies, parental resources become one of the main channels on which young Italians may rely to achieve independence from their parents. Since families differ markedly in terms of their human and social capital, as well as economic resources, this may amplify existing inequalities in children's outcomes. Moreover, dependence on intergenerational transfers is an additional factor hampering the transition to adulthood and discouraging labour mobility choices.

The evolution of the Italian housing and rental market

Since the early 1990s Italian house prices and rents have exhibited substantial growth. Between 1989 and 2008 house prices more than doubled (Muzzicato *et al*. 2008), while the Italian consumer price index increased by 75 percentage points. At the same time, rents rose by 80 percentage points over the period 1998–2006 (Rondinelli and Veronese 2011), with severe distributional implications.

The key variable with which to assess the role of house and rent prices in the youth emancipation decision is obtained from the CI sample using various steps of aggregation. We follow the same procedure as in Muzzicato *et al*. (2008) and Rondinelli and Veronese (2011) to calculate a house and rent price index at the national level, respectively. As far as rent is concerned, we first aggregate prices at the city level (centre, semicentre and suburb), using weights computed from the SHIW sample; then, using weights according to the population residing in each town, we obtain national averages. Rental prices are available since 1993 and their value back to 1989 is recovered using the rent price deflator from the national accounts. We obtain real values by using the consumer price deflator for the total of Italian households. The evolution of these indexes is depicted in Figure 9.1.

Over the period 1989–2008, real house prices increased by 54 per cent (see Figure 9.1); the upward increase in real rents has been sharper 1995. The sharp increase in housing and rental prices was particularly marked after the introduction of the euro. The household per-capita disposable income dynamic was much more subdued, the cumulative growth between 1989 and 2008 being about 13 per cent.

We argue that the upward trend observed in housing and rental prices, together with uncertainty in the labour market and a higher unemployment rate, may have further postponed emancipation for young Italians.

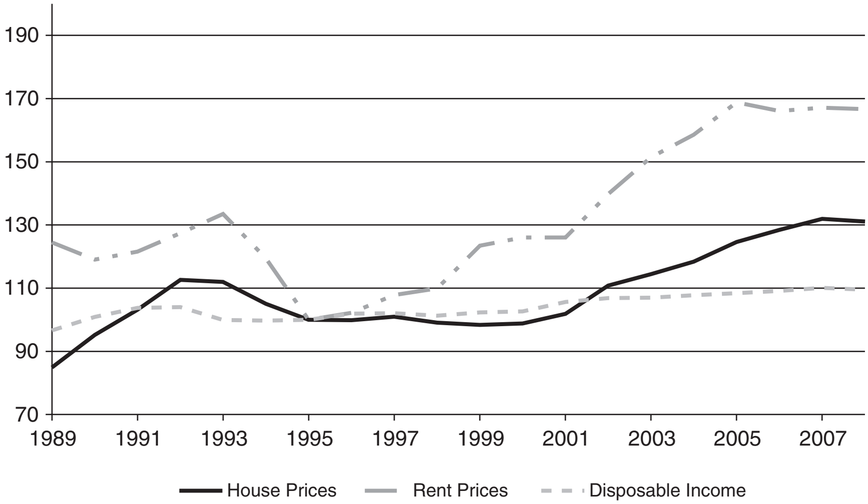

Figure 9.1 Real house and rent prices and per-capita disposable income

Notes: Authors' calculation from CI, national accounts and Bank of Italy. Annual data; index: 1995=100

Empirical methodology and data description

Empirical methodology

We model the process of leaving home as a discrete time hazard model where young people are potentially at risk of leaving home from the first year when they enter the panel onwards and/or they are 18.[3] The sample is restricted to include youth aged between 18 and 35 years over the period 1989–2008, living at home with at least one parent at the time of the interview. Youths are considered to leave the parental home if, using the panel component of the survey, they belong to the same household identification in period $t-1$, but not in period t.[4]

We assume that the probability that youth i living in province j experiences transition out of the parental home at time t, conditional on survival to $t-1$, is given by

$$\Pr\left(d_{ijt}=1 \mid d_{ij,t-1}=0\right)=\Pr\left(z^*_{ijt} \mid d_{ij,t-1}\right), \tag{9.1}$$

where d_{ijt} is a dummy variable indicating the event's occurrence in t for individual i in province j, and z^*_{ijt} is a continuous latent variable which is greater than zero if $d_{ijt}=1$ and less than or equal to zero otherwise. Additionally,

$$z^*_{ijt}=f(t)+\beta X_{ijt}+\gamma P_{jt}+\varepsilon_{ijt}. \tag{9.2}$$

and $f(t)$ is a non-parametric function of age, chosen as a duration dependence, X_{ijt} is assumed to capture the demographics of both the youth and the household, while P_{jt} summarizes the price effects on youth emancipation at the province level. ε_{ijt} is a residual error term with a logistic distribution with mean zero and variance $\pi^2/3$.

The duration dependence, $f(t)$, describes how leaving home decisions change with the age of the youth. It is parameterized as a step function given by

$$f(t) = \sum_{\tau=18}^{35} \phi_\tau D_{\tau t} \tag{9.3}$$

where

$$D_{\tau t} = \begin{cases} 1, & \text{if } t = \tau, \\ 0, & \text{otherwise,} \end{cases}$$

and ϕ_τ, $\tau = 18,...,35$, are the corresponding coefficients.

The hazard probability conditioned on observed explanatory variables, X_{ijt} and P_{jt}, can thus be rewritten as a sequential logit model:

$$Pr\left(d_{ijt} = 1 \mid d_{ij,t-1} = 0, X_{ijt}, P_{jt}\right) = h_{ijt} = \frac{\exp\left(z_{ijt}\right)}{1+\exp\left(z_{ijt}\right)}, \tag{9.4}$$

where

$$z_{ijt} = f(t) + \beta X_{ijt} + \gamma P_{jt}. \tag{9.5}$$

Our sample includes all youths aged between 18 and 35 years over the period 1989–2008 living at home with at least one parent at the time the household was sampled. As the youths enter the sample at the age of 18 we end up with a stock sample with delayed entry. Jenkins (1995) proved that, even with a stock sample with left truncation, the likelihood of a single-spell discrete time duration model reduces to a standard likelihood function for a binary regression model. At the age of 35 young individuals may have experienced transition out of the parental home (the likelihood contribution for each completed spell is given by the discrete time density function). or still be living with their parents (the likelihood contribution for a censored spell is given by the discrete time survivor function). The likelihood for the whole sample can be written as

$$\log L = \sum_{i=1}^{n} \sum_{j=1}^{J} \sum_{t=1}^{T} [z_{ijt} \log h_{ijt} + (1 - z_{ijt}) \log(1 - h_{ijt})], \tag{9.6}$$

where z_{ijt} is the dependent variable and the data have been organized into *person period format*, i.e. one record for each year that a person is at risk of transition out of the parental home.

In the models considered so far, all differences between individuals are assumed to be captured by observed explanatory variables. However, Nicoletti and Rondinelli (2010) proved that ignoring the unobserved heterogeneity in sequential logit models causes the covariate coefficients to be estimated up to a scale factor; this rescaling factor is found to be close to one in the presence of time-varying (P_{ij}) observed covariates.

The set of regressors that we use to model home leaving decisions are derived from different sources and are grouped to account for demographic, household, local, economic and cultural conditions. Below we describe the data sources used in the chapter and provide some descriptive statistics.

Data description

To analyse the economic behaviour of young people in leaving the parental home we use the biannual panel version of the SHIW (1989–2008), whose sample is composed of around 8,000 households per wave drawn from the registry office records of 330 municipalities. Data are collected by means of professional interviews and are representative of the universe of Italian dwellings, either owned or rented. We use the SHIW database to infer the demographic characteristics of the individual and the household. The estimates of the value of housing stock obtained from SHIW for the subsample of the home owners are a key element in measuring Italian households' wealth (see Cannari and Faiella 2008). Despite this, it has been proved (Rondinelli and Veronese 2011) that the estimated rent price measure based on the SHIW sample for a given year is a mixture of new and renewed contracts. As the dynamics of the new rent contract are expected to be more important for those individuals considering whether or not to change their residence, we resort to a market price value for owners and renters from the CI.

The CI sample has been widely used to study both house (see Muzzicato *et al*. 2008) and rental (Rondinelli and Veronese 2011) price developments. In each sampled town, CI provides estimates of the average house and rent level (per square metre) of a typical apartment located in three city areas: centre, semicentre and suburbs. Houses are further distinguished into newly built and restructured, rents into new and renewed contracts, the latter defined as contracts negotiated with previously sitting tenants upon contract expiration. The CI records house and rent prices at the provincial level since 1980 and 1993 respectively, and it provides the market value for both housing and rental dwellings. House and rent prices from the CI are then matched to each young individual of the SHIW sample on the basis of the province of residence, year and location of the house.

The price that a youth faces when experiencing the transition from home is expressed in real terms and as a mean of the three quotations for centre, semicentre and suburb of the province where the youth lives (P_{jt}). Our results are not compromised by this assumption because only 1.1 per cent per year of the youths, as a proportion of the total number of residents, aged 15–34 (in the period 2000–5) changed their original region (Istat). This percentage amounts to 1.3 per cent (0.7 per cent) for those in the age class 25–34 (15–24). Slightly higher rates (by 0.3–0.4 per cent) emerge for those with higher education.

We try to capture the local economic conditions by constructing an indicator for the labour and credit markets. The former is calculated by using the unemployment rate by age, sex, education and geographical area, as derived from the official statistics of the National Institute of Statistics. Using the Bank of Italy data (Base Informativa Pubblica at August 2010),[5] the latter is obtained as the ratio between the amount of credit received every year by the households residing in a certain Italian region and the gross domestic product for the same year and region.

Cultural aspects are captured by using both the World Values Survey (2005–6 wave) and the European Values Study (1990 and 1999 waves) to account for differences in social values across time and Italian regions (see also Chiuri and Del Boca 2008, 2010). Our indicator is obtained at macro-area level (North-East, North-West, Central, South, Islands) and aims to capture the importance that parents give to the independence of their children.[6] As a proxy for the local marriage market we use the regional sex ratio computed as the ratio between female population and total population of the same cohort and living in the same region.[7]

We study Italian youth emancipation from 1989 to 2008, where the SHIW figures for two non-consecutive years are obtained by interpolation. The sample is restricted to include those aged between 18 and 35 years over the studied period, living at home with at least one parent at the time of the interview.[8]

Every year about 16 per cent of the SHIW sample is composed of young people aged between 18 and 35; the attrition for the panel dimension of the survey is about 50 per cent over two consecutive years. Table 9.1 reports descriptive statistics for young people. Overall there are 4,761 (3,788) observations in the male (female) sample (19,662 and 14,684 *person period observations*). About 91 per cent (88 per cent) of men (women) aged 18–35 in the SHIW live with their parents; the proportion is higher than that recorded in the European Community Household Panel (ECHP) because in the SHIW sample we condition on children with at least one parent alive. The average age is about 24, and half of the sample is aged less than 23. 52 per cent (64 per cent) of males (females) aged 18–35 are not employed, with an equal percentage of students and non-students for males; the proportion of students is higher for women. More than half of the young people have completed high school, and 37 per cent (25 per cent for females) reported low education.

The average age of the head of household[9] is about 50, and 24 per cent of heads are out of the labour force. Average real wealth of the household of origin is €0.18 million (Table 9.1).

Table 9.1 Descriptive statistics

Variable	*Male*			*Female*		
	Obs.	*Mean*	*Std. dev.*	*Obs*	*Mean*	*Std. dev.*
Outcome						
Out of parental home	19,662	0.094	0.29	14,648	0.12	0.32
Individual characteristics						
Age (18–24)	19,662	0.56	0.50	14,648	0.61	0.49
Age (25–29)	19,662	0.29	0.45	14,648	0.27	0.44
Age (30–35)	19,662	0.15	0.36	14,648	0.12	0.33
Payroll employee	19,662	0.37	0.48	14,648	0.30	0.46
Self-employed	19,662	0.11	0.31	14,648	0.05	0.23
Inactive (unemployed, students and out of the labour force)	19,662	0.52	0.50	14,648	0.64	0.48

(*Continued*)

Table 9.1 (Continued)

Variable	*Male*			*Female*		
	Obs.	*Mean*	*Std. dev.*	*Obs*	*Mean*	*Std. dev.*
Student	19,662	0.26	0.44	14,648	0.36	0.48
Inactive non-student	19,662	0.26	0.44	14,648	0.29	0.45
None, elementary and middle school education	19,662	0.37	0.48	14,648	0.25	0.44
High school (diploma)	19,662	0.55	0.50	14,648	0.64	0.48
Bachelor's degree and beyond	19,662	0.08	0.27	14,648	0.11	0.31
Household's characteristics						
No. of members other than self and parents	19,662	1.18	1.03	14,648	1.18	1.01
No. of income earners	19,662	2.34	0.99	14,648	2.24	0.98
HH's age	19,662	48.45	12.76	14,648	50.42	11.58
HH: none and elementary education	19,662	0.25	0.43	14,648	0.27	0.45
HH: middle school	19,662	0.34	0.47	14,648	0.28	0.45
HH: high school	19,662	0.32	0.47	14,648	0.36	0.48
HH: bachelor's degree and beyond	19,662	0.09	0.28	14,648	0.09	0.28
HH: payroll employee	19,662	0.55	0.50	14,648	0.54	0.50
HH: self-employed	19,662	0.21	0.41	14,648	0.21	0.41
HH: inactive	19,662	0.24	0.43	14,648	0.24	0.43
Only father	19,662	0.03	0.18	14,648	0.03	0.17
Only mother	19,662	0.13	0.34	14,648	0.10	0.31
Father and mother	19,662	0.84	0.37	14,648	0.87	0.34
North	19,662	0.39	0.49	14,648	0.38	0.49
Center	19,662	0.18	0.38	14,648	0.17	0.37
South/Islands	19,662	0.43	0.50	14,648	0.45	0.50
Real wealth (€ million)	19,662	0.18	0.31	14,648	0.18	0.31
Financial wealth (€ million)	19,662	0.02	0.06	14,648	0.02	0.06
Provincial characteristics						
Real house prices (€ thousand/m^2)	19,662	1.59	0.74	14,648	1.57	0.72
Real rent prices (€ thousand/m^2)	19,662	0.07	0.03	14,648	0.07	0.03
Sex ratio	19,662	0.49	0.01	14,648	0.51	0.01
Independence	19,662	21.39	5.86	14,648	21.18	5.94
Loan/value added	19,662	5.17	0.70	14,648	5.14	0.71
Unemployment rate	19,662	25.23	12.59	14,648	25.79	12.70

Source: Authors' calculations from the SHIW and national statistics. Sample weights included. Youth people between 18 and 35 included in the sample. HH = head of household. Only father (mother) is a dummy variable taking value 1 if the youth is living with one parent only. Father and mother is a dummy variable taking value 1 if both parents are leaving with the young people.

Mean real house prices per square metre are €1,590 and €1,570 for males and females, respectively; annual rents are on average €70 per square metre for both groups.

Empirical results

Baseline results

Table 9.2 reports the results for the likelihood of leaving parental home. We estimate separate models for males and females and explore the effects of housing prices and rents on home leaving decisions. As Italian students are more likely to reside with their parents (Mazzucco *et al*. 2006) we split the sample to include non-students only (Tables 9.3–9.5).

House and rent prices are found to strongly affect the transition to adulthood. Our results show the crucial role played by housing costs in determining young adults' residential choices: higher housing prices and rents decrease the probability of residing away from parental home for both males and females, the latter for the female sample only. In order better to grasp the size of the effect of the real estate market on coresidence choices, we compute the change in the probability of leaving home induced by a one-standard-deviation (SD) change in real house prices and real rents (Table 9.3). A one-SD change in real house prices is equal to €730 and it would induce a reduction of 0.45 (1.18) percentage points in the male (female) probability of moving out, from 4.1 per cent (5.2 per cent) to 3.7 per cent (4.0 per cent).[10] The effect of a one-SD change in real rents (€30 per square metre) for females is in line with that calculated for house prices (there is no significant effect for males), amounting to slightly more than 1 percentage point. Given a mean annual rent of about €70 per square metre, the increase in price due to an increase in the size of the apartment from 30 to 50 square metres would decrease the probability of leaving the parental home by slightly more than one-third of a percentage point (to 4.8 per cent).

Table 9.2 Estimates for the probability of leaving the parental home

Variables	*(1) male*	*(2) male*	*(3) female*	*(4) female*
House prices	–0.00616**		–0.0161***	
	(0.00311)		(0.00429)	
Rent prices		–0.0828		–0.362***
		(0.0749)		(0.117)
High school diploma (middle school)	0.00218	0.00236	0.00444	0.00392
	(0.00484)	(0.00485)	(0.00639)	(0.00642)
Bachelor's degree and beyond	0.0169*	0.0170*	0.0245**	0.0241**
	(0.00893)	(0.00898)	(0.0113)	(0.0112)
Not employed not student	–0.00920*	–0.00903*	–0.0125**	–0.0127**
	(0.00482)	(0.00485)	(0.00616)	(0.00616)

(*Continued*)

Table 9.2 (Continued)

Variables	*(1) male*	*(2) male*	*(3) female*	*(4) female*
Student	–0.0259***	–0.0258***	–0.0429***	–0.0429***
	(0.00507)	(0.00511)	(0.00626)	(0.00627)
Real wealth	0.0001	–0.000157	–0.0223**	–0.0226**
	(0.00393)	(0.00409)	(0.0113)	(0.0114)
Financial wealth	0.0494***	0.0487**	0.0152	0.0191
	(0.0189)	(0.0190)	(0.0364)	(0.0360)
No. of members other than parents and youth	–0.000195	–0.000175	0.00597**	0.00602**
	(0.00219)	(0.00221)	(0.00279)	(0.00281)
No. of income earners	0.00271	0.00286	–0.000197	0.000191
	(0.00248)	(0.00249)	(0.00325)	(0.00323)
HH's age	0.0001	0.0001	–0.0001	–0.0001
	(0.000189)	(0.000190)	(0.000246)	(0.000246)
HH middle school	0.00135	0.00116	0.00114	0.000932
	(0.00515)	(0.00517)	(0.00669)	(0.00669)
HH high school	0.00154	0.00127	–0.00955	–0.0101
	(0.00542)	(0.00545)	(0.00703)	(0.00703)
HH bachelor's degree	0.00230	0.00206	–0.00297	–0.00366
	(0.00761)	(0.00764)	(0.00936)	(0.00929)
HH employee	0.0104*	0.0105*	0.00494	0.00545
	(0.00544)	(0.00544)	(0.00674)	(0.00672)
HH self-employed	–0.000188	–5.80e–05	0.0103	0.0115
	(0.00620)	(0.00622)	(0.00877)	(0.00888)
Only father	–0.00596	–0.00650		
	(0.00923)	(0.00915)		
Only father * age (18–24)			0.0871	0.0885
			(0.0583)	(0.0589)
Only father * age (25–35)			–0.0391***	–0.0395***
			(0.00598)	(0.00595)
Sex ratio	0.455	0.429	0.426	0.428
	(0.375)	(0.375)	(0.515)	(0.520)
Independence	0.000679*	0.000579	0.00144***	0.00133**
	(0.000359)	(0.000357)	(0.000530)	(0.000527)
Loan/value added	0.00256	0.00166	0.0109***	0.0104**
	(0.00292)	(0.00299)	(0.00400)	(0.00408)
Person period obs.	19,662	19,662	14,648	14,648
Pseudo R^2	0.1	0.1	0.1	0.1
Percentage correctly classified	95%	95%	94%	94%

Notes: Marginal effects for the probability of leaving home. HH = head of household. A weighed discrete time duration model with single spell is assumed. Duration dependence not reported, but depicted in Figure 9.2. The sample includes all people aged between 18 and 35. Robust standard errors in parentheses. Real house and rent prices in thousands of euros.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 9.3 The effect of housing prices and end of education on the probability of leaving home

	One-SD change			
	Male		*Female*	
	House price	*Rent*	*House price*	*Rent*
All	–0.45**	–0.24	–1.18***	–1.06***
Person period obs.	19,662		14,648	
Observations	4.761		3.788	
Students	0.12	0.40**	–0.57***	–0.48**
Person period obs.	5.557		5.463	
Observations	1.384		1.437	
Non-students	–0.73**	–0.54*	–1.62***	–1.44**
Person period obs.	14,105		9,185	
Observations	3,377		2,351	

Notes: Effect of a one-SD change in house prices and rents on the probability of leaving home (percentage points) for the sample of students and non-students. A weighed discrete time duration model with single spell is assumed. The sample includes all people aged between 18 and 35. Regressors listed in Table 9.2 included. Real house and rent prices in thousands of euros.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

The strong positive impact of age on the youth emancipation is recovered from the duration dependence depicted in Figure 9.2. We compute the hazard rates only for those individuals who could potentially be observed for the entire period 18–35 (i.e. people born between 1971 and 1973). There is an inverted U-shaped relation between the probability of leaving parental home and age, with a maximum at 31: young people not experiencing the transition before their thirties have a low probability of emancipation because the hazard rate at the age of 35 is equal to that at age 24 (0.06 for males and 0.07 for females). Women are more likely to leave home than men. Geographical differences are at play, especially for females: at the age of 31 the hazard rate of women living in the North is 5 percentage points higher than in the South. The subsequent downward trend is more marked in the North, thus reducing the regional gap. We observe geographical differences for males only at older ages, with young people in the North at a higher risk of leaving home.

The family background variables matter as well (Table 9.2): the number of household members, other than the individual and parents, has a positive and significant effect for females (in line with Mencarini and Tanturri 2006; Giannelli and Monfardini 2003). The number of income earners has no effect. Women with higher real wealth are less likely to leave home, while financial wealth seems to positively affect home leaving transition for males only. The estimated coefficients for the human capital of the head of household (in most cases the father) are not significantly different from zero, for both males and females. As regard household head's working status, we find only a small positive effect of being an employee for males. The presence of the father only has a strong negative impact

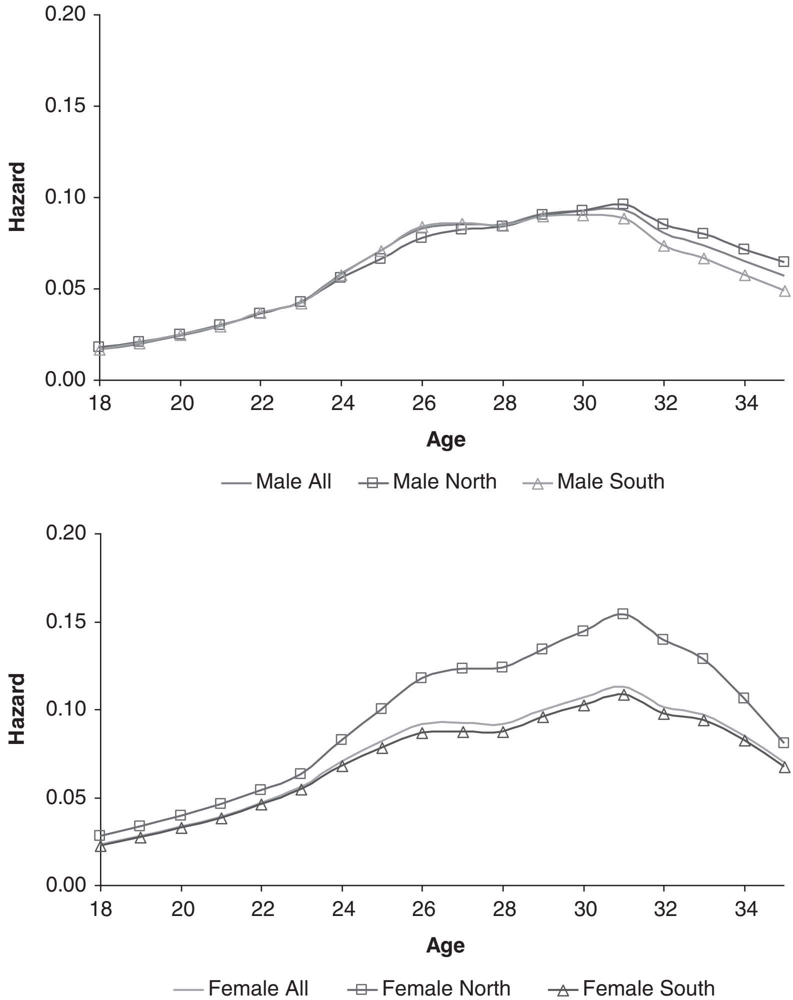

Figure 9.2 Estimated age effect for the probability of leaving home

Notes: Duration dependence for male and female, by geographical area. Youths born between 1971 and 1973 included in the sample.

on the probability of leaving home for women aged between 25 and 35 (we interacted this variable with cohort dummies). This suggests that a young woman may stay at home to take care of her father when the mother is absent. Evidence for the importance of cultural aspects for females emerges from Table 9.2. Living in regions with a high percentage of households citing independence as a social value increases the probability of leaving the parental home. Similarly, the ratio between the amount of credit received by the households corrected by the gross domestic product of the region has a positive effect for females, highlighting the importance of the credit market for youth emancipation.

Occupational status, and in particular the condition of not being employed (either unemployed or out of the labour force) is a key determinant variable impacting on the youth emancipation decision (Table 9.2). Consistently with the previous literature, the condition of being non-employed impacts on the probability of leaving home; the employment type, i.e. payroll employees or self-employed, is not relevant. As noted by Aassve *et al*. (2002), the labour market effect, i.e. being employed or not, is particularly strong in the Italian setting, embodied with a weak welfare system supporting young adults. Differentiating between students and other non-working people (those looking for a job), we find that the negative effect of the former is, in absolute values, much higher than that of the latter. This reflects a typical feature of the Italian context whereby the youngest people live with their parents while studying (Giannelli and Monfardini 2003; Mazzucco *et al*. 2006). As a consequence, highly educated youths are more likely to leave the parental home.

Further extensions

Because education is one of the main reasons for people to stay at home (as shown in Table 9.2), we should expect students to behave differently. Whereas housing prices have no impact on male students, a one-SD change in house prices and rents for non-students significantly reduces their probability of leaving the parental home by about two-thirds of a percentage point and half a percentage point, from 5.3 per cent to 4.6 per cent and 4.8 per cent, respectively (see Table 9.3). House and rent prices matter for both student and non-student females, the marginal effect being higher for the latter: a one-SD change in house prices leads to a 0.6 and 1.6 percentage point reduction for students and non-students, respectively (from 2.1 per cent and 7.7 per cent); a similar increase in rents reduces the probability by 0.5 and 1.4 percentage points for the two categories (to 1.6 per cent and 6.3 per cent). Our results confirm that emancipation follows the end of education, and suggest that this sequence is more rigid for men: young men do not leave the parental home while they are studying regardless of house prices.

Given the different behaviour between students and non-students, we conduct a further robustness check for our results, focusing on the sample of non-students (see Tables 9.4 and 9.5). We test whether the effect of housing costs varies across segment of populations, impacting particularly on lower-income and non-employed young people. Table 9.4 reports the results for the interactions between house (and rent) prices and the dummies for being employed or otherwise (unemployed or out of the labour force). Housing costs have a significant impact for both groups of females with a higher effect for non-employed (and non-student) individuals (a one-SD change in house prices decreases the probability of 7.7 per cent by one percentage point when employed, 2.5 percentage points when not employed). House prices matter only for employed males, while rents do for young females not employed. These results support the idea that a very low proportion of males would quit the parental home when not employed; some evidence of the role of the marriage market emerges for unemployed women.

The effects of housing costs interacted with quartiles of household income are shown in Table 9.5. Housing costs have an impact on male (non-student) decisions

Table 9.4 The effect of housing prices and occupational status on the probability of leaving home

Variables	*One-SD change*			
	Male		*Female*	
House prices × employed	–0.72*		–1.12*	
House prices × not employed	–0.76		–2.54***	
Rent prices × employed		–0.49		–0.94
Rents prices × not employed		–0.69		–2.32***
Duration dependence	yes	yes	yes	yes
Education	yes	yes	yes	yes
Occupation	yes	yes	yes	yes
No. of members other than parents and youth	yes	yes	yes	yes
No. of income earners	yes	yes	yes	yes
Wealth	yes	yes	yes	yes
HH's variable (age, education, occupation)	yes	yes	yes	yes
Marriage market	yes	yes	yes	yes
Credit market	yes	yes	yes	yes
Cultural variables (independence)	yes	yes	yes	yes
Person period obs.	14,105		9,185	
Observations	3.377		2.351	

Note: Effect of a one-SD change in house prices and rents on the probability of leaving home (percentage points) for the sample of non-students. HH = head of household. A weighed discrete time duration model with single spell is assumed. The sample includes all non-student males and females aged between 18 and 35. Real house and rent prices in thousands of euros.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

for all low income levels but the highest: the effect of a one-SD change in house prices amounts to 1.7 percentage points for the first quartile and to 1.0 for the second and third quartiles, respectively (from 5.3 per cent to 3.6 per cent and 4.3 per cent). Rents only have an effect for low and high income levels for the sample of non-student males with a slightly smaller effect than house prices (see Table 9.5). House prices and rents have no impact for non-student women whose household income is high and very high. An increase in housing prices induces a larger decrease for medium-income households than for the poorest ones: a one-SD change in house prices reduces the probability by 1.7 and 5 percentage points for the first and the second household income quartiles, respectively (to 6.0 per cent and 2.7 per cent). The coefficient of rents for poor females is not statistically different from zero.

Dummies for household income quartiles are not statistically significant. We would have expected a stronger impact of household income given the high incidence of intra-household transfers on youth emancipation in Italy due to mortgage market imperfections and the absence of public housing policy. As pointed out by Aassve *et al*. (2002), the weakness of the effect may be caused by the double role of family income on leaving home: on the one hand, high-income households may give financial support to youths and thus facilitate their emancipation; on the other, parents may have a preference for cohabitation and thus transfer resources to the children living with them (Manacorda and Moretti 2006).

Table 9.5 The effect of housing prices and household income on the probability of leaving home

Variables	*One-SD change*			
	Male		*Female*	
House prices × low HI	–1.66**		–1.74**	
House prices × medium HI	–1.04*		–4.94***	
House prices × high HI	–1.02**		–0.89	
House prices × very high HI	–0.10		–0.36	
Rent prices × low HI		–1.16*		–1.16
Rent prices × medium HI		–0.75		–5.64***
Rent prices × high HI		–0.75*		–0.98
Rent prices × very high HI		–0.12		0.26
Duration dependence	yes	yes	yes	yes
Education	yes	yes	yes	yes
Occupation	yes	yes	yes	yes
Household income (quartiles)	yes	yes	yes	yes
No. of members other than parents and youth	yes	yes	yes	yes
No. of income earners	yes	yes	yes	yes
Wealth	yes	yes	yes	yes
HH's variable (age, education, occupation)	yes	yes	yes	yes
Marriage market	yes	yes	yes	yes
Credit market	yes	yes	yes	yes
Cultural variables (independence)	yes	yes	yes	yes
Person period obs.	14,105		9,185	
Observations	3,377		2,351	

Note: Effect of a one-SD change in house prices and rents on the probability of leaving home (percentage points) for the sample of non-students. HH = head of household. A weighed discrete time duration model with single spell is assumed. The sample includes all non-student malea and females aged between 18 and 35. Robust standard errors in parentheses. Real house and rent prices in thousands of euros.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

One possible shortcoming of our analysis is that P_{jt} may capture both time-varying differences in house prices and structural differences across cities that do not vary with time. In order to separate these two effects we include city fixed effects among the controls. Results strengthen the role of the real estate market on youth emancipation, since marginal effects of house prices and rents increase.[11]

A cohort and simulation exercise

We present the evolution of hazards by age for cohorts of young people (non-students). Three cohorts were constructed: individuals born between 1965 and 1970 (which will be named cohort 1), 1971–5 (cohort 2), 1976–82 (cohort 3). As the econometric analysis was limited to youths aged 18–35 from 1989 to 2008 some cohort restrictions apply: age 22–35 for cohort 1, age 18–35 for cohort 2, and age

18–29 for cohort 3 (considering the median age of the cohort). The severe economic crisis at the beginning of the 1990s affected cohorts 1 and 2 at the age of 26 and 20, respectively. In 1993 Italian GDP decreased by about 1 per cent. Unemployment rates for the age groups 15–24 and 25–34 were 0.24 and 0.09 respectively in 1991, increasing to 0.30 and 0.12 in 1993; at the same time employment rates decreased from 0.31 to 0.28 for the 15–24 group, and from 0.69 to 0.65 for people aged 25–34 (see also the 'Determinants' section above). Cohorts 2 and 3 entered adulthood in a period of labour market reforms (the introduction of the so-called *parasubordinati* in 1996 and the Biagi law in 2003), facing some of the difficulties of the recent global crisis, in terms of an upward increase in both house prices and the unemployment rate.

As Figure 9.3 shows, the hazard rate increases with age: the probability of leaving the parental home for males is slightly higher for cohort 1 between 22 and 25 and it is lower for cohort 3 after 25 years of age. Cohort 2, which behaves like cohort 3 until the age of 25, has a profile very close to cohort 1 after that

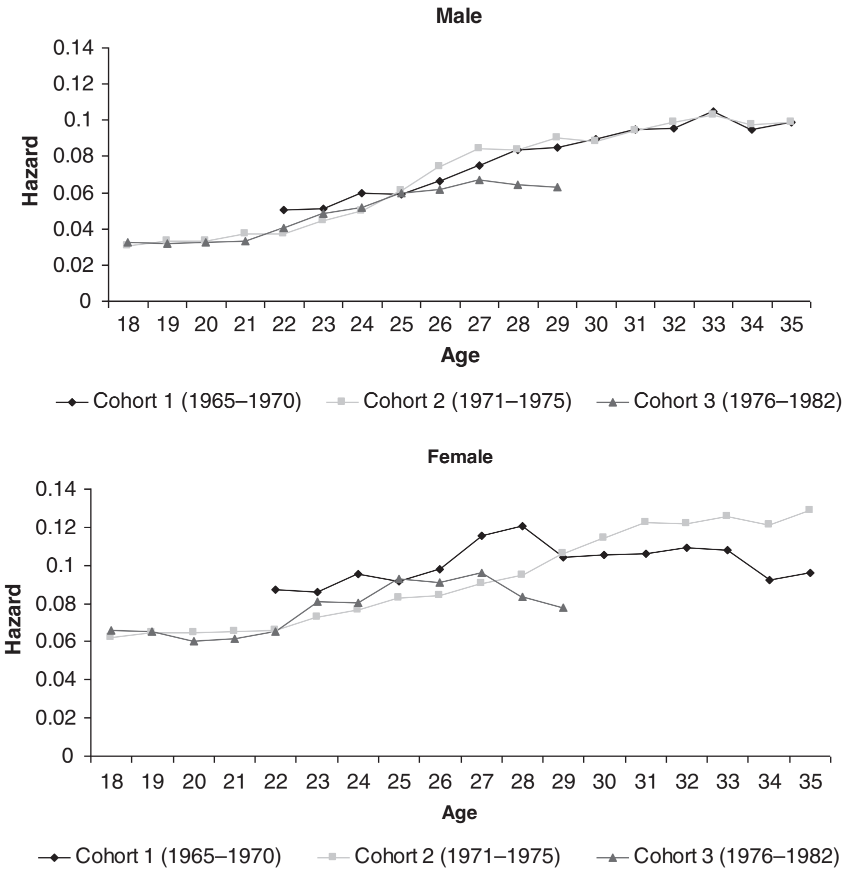

Figure 9.3 Simulated hazard by cohorts

Notes: Predicted hazard rates from SHIW for males and females.

age. Cohort 2 of females experienced the highest upward increase in the hazard rate, with a pace of growth very similar to that of cohort 3 until 27. Women born between 1965 and 1970 are at a higher risk of leaving home than other women at an early age, but the hazard is fairly stable over time, thus leading to a lower probability of emancipation than that of cohort 2 after the age of 29.

We now focus on the relevant years in which young people are expected to leave home (22–29), and compare the evolution of hazards with that of real house prices. The first striking feature of Figure 9.4 is that cohort 2 exhibits growth rates higher than these of other cohorts, and they face a real house price that is fairly stable. By contrast, the oldest and the youngest cohorts faced a sharp increase in house prices prior to the two recent economic crises. These patterns are exhibited

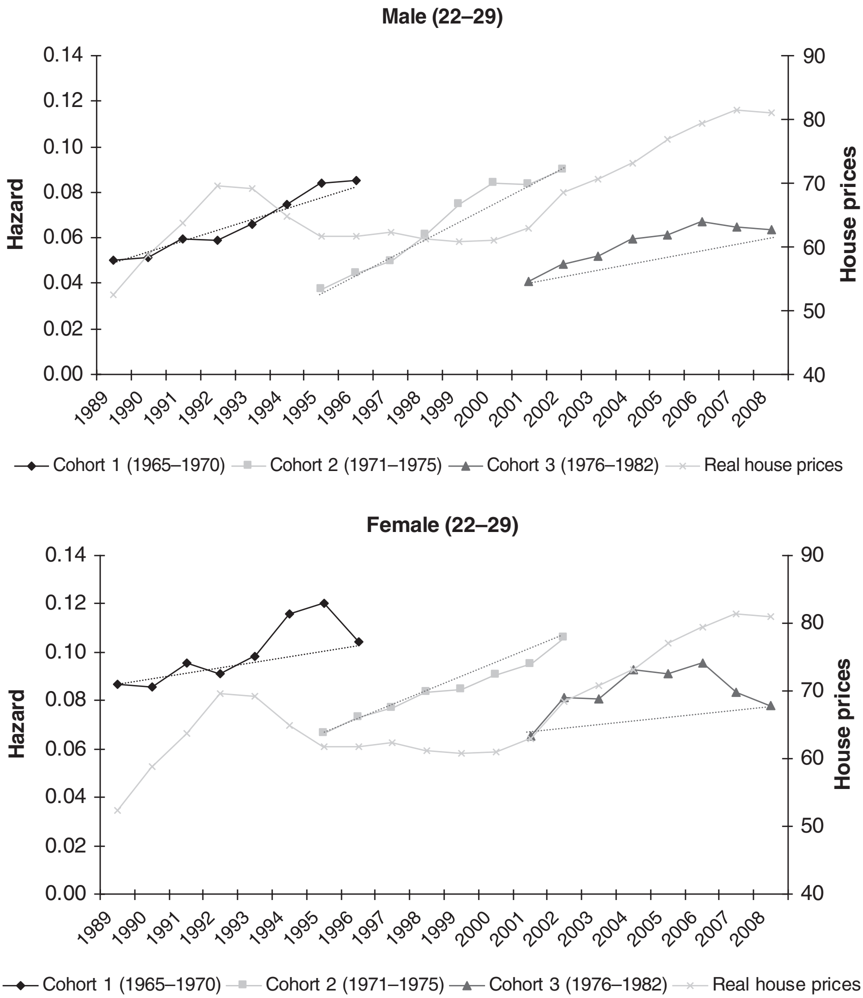

Figure 9.4 Simulated hazard by cohorts for youths

Notes: Predicted hazard rates from SHIW. Youths aged 22–29 included in the sample. CI house prices.

by both males and females: the overall growth rates of male (female) hazards are 0.7 (0.2), 1.4 (0.6) and 0.6 (0.2) for cohorts 1, 2 and 3, respectively. Overall, those born in 1965–70 and 1976–82 were mainly penalized by the economic challenges they faced during their adulthood.

To emphasize differences among subgroups, we simulated some results to investigate the dimension of our estimated parameters. A clear pattern emerges when considering the timing of the home leaving decision according to the youth's residence, city centre or suburbs: the transition out of the parental home is faster for those living in suburbs than for young people resident in the centre. The gap widens at older ages.

In order to highlight the role of house prices in the transition out of the parental home for cohort 3, we simulated their survival functions at the prices faced by cohort 2 for a central location of the house and a suburban one. Cohort 3 was expected to leave home in 2001–8, cohort 2 in 1995–2002. In these periods, mean real house prices were respectively €2012 (€1170) and €1583 (€955) per square metre in the center (suburbs). If cohort 3 faced the same house prices as cohort 2, this would have increased their likelihood of emancipation. In particular, Figure 9.5 shows that even a decrease in house levels would have implied an

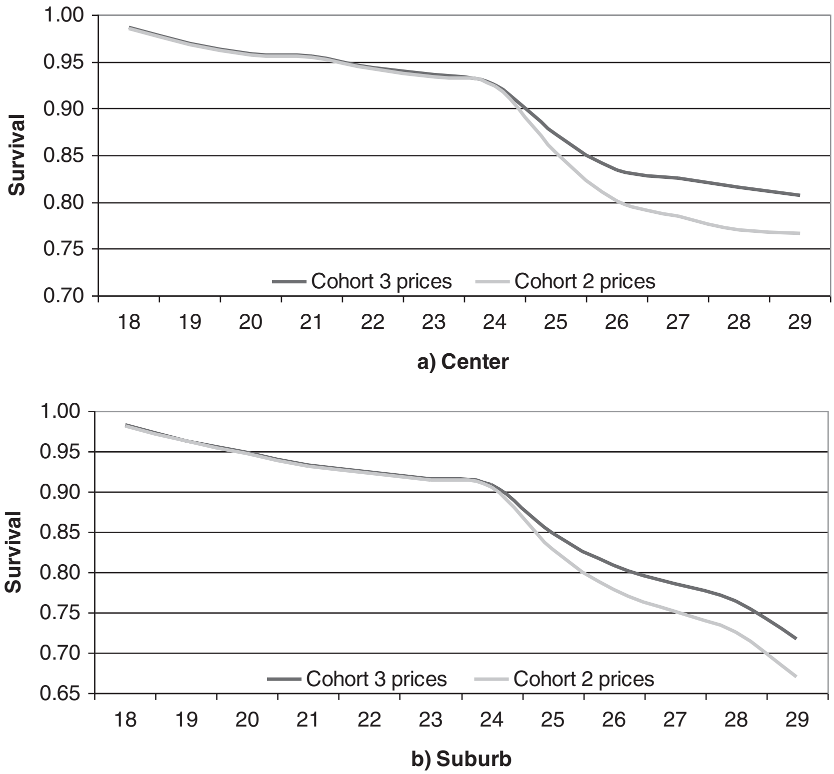

Figure 9.5 Predicted survival functions for centre and suburbs

Notes: Predicted survival functions from SHIW. Cohort 3 (1976–82) included in the sample.

identical probability of staying at home for youths aged under 24. There are sizable differences in the home leaving process at adult ages, meaning that if house prices had decreased to the mean of 1995–2002, the likelihood of a youth leaving the parental home would have increased by 5 percentage points in the centre and 7 percentage points in the suburbs at the age of 29.

Overall, the appreciation of the real estate market in the past decade, together with structural reforms of the labour market, have worsened the economic conditions of youths born in 1976–82.

Conclusions

This chapter investigates the role of house and rent prices in explaining the high rate of young Italians living with their parents. Our work is the first study to concentrate on this issue in Italy, and the main contribution is that we have based our analysis on detailed information about the market value of house prices and rents. We have used two different data sets, one to infer the demographic characteristics of the household and the other to recover house and rent prices based on the dwelling market value. House prices have been found to be negatively correlated with the youth emancipation for both males and females: a one-SD change in real house prices would induce a reduction of 0.45 and 1.18 percentage points in the probability of moving out for males and females, from 4.1 per cent to 3.7 per cent and from 5.2 per cent to 4.0 per cent, respectively. Rents strongly affect females' decisions and have little impact on non-student males. The magnitude, however, exhibits a sex composition with higher marginal effects for women.

Youth emancipation has been found to come after the end of education, suggesting a more rigid sequence for men: young men do not leave the parental home while they are studying, regardless of house prices. Among non-student people, an increase in house prices postpones home leaving decisions for employed males and for unemployed females (rents matter only for the latter): men tend to begin their working lives in the parental home, regardless of house prices; there is evidence of the role of the marriage market for unemployed females. As expected, the impact of the real estate market for high-income households is negligible. House and rent prices force medium-income (non-student) females to postpone more than poor ones.

A cohort analysis has revealed that, owing to structural reforms of the labour market and the sharp increase in house and rent prices at the beginning of the last decade, the economic conditions of individuals born in 1976–82 deteriorated when they were supposed to enter adulthood. On the other hand, the 1971–5 cohort faced a flat profile of house and rent prices between 22 and 29, the age at higher risk of leaving the parental home. A simulation exercise proved that at the age of 29 the youngest cohort would have increased the propensity to leave parental home by about 6 percentage points if it had faced the same house prices as the cohort born in the years 1971–5.

Females behave quite differently from men: cultural factors prove to be significant predictors of the propensity to live with parents, reflecting the traditional Italian cultural setting where women are primarily responsible for childcare and other non-market services, because the home leaving decision is strongly and negatively affected by the presence of the father only for women aged 25–35. Living in regions with a high percentage of households citing independence as a social value increases the probability of residing away from the parental home; the credit market has also been found have a non-negligible impact on female emancipation.

Policies aimed at reducing the cost of housing would reduce the probability of coresiding with parents, the effect being higher if they are targeted on young unemployed people and on those youths whose parental income is medium or low. Because the housing shortage, more marked in the last decade especially in regard to the cheapest dwellings, and the recent global crisis have reduced both the probability of youths being employed and the household income, larger investments are needed in social housing projects.

Acknowledgements

We are grateful for their helpful comments and suggestions to: Gabriella Berloffa, G. C. Giannelli, C. Nicoletti and seminar participants at Banca d'Italia, University of Trento and Verona, IGIER, Dondena (Bocconi University), European Economic Association (Glasgow, 2010), Ecineq (Catania, 2011), EALE Annual Conference (Bonn, 2012), Brucchi Luchino workshop (Trento, 2012), SIE Annual Conference (Matera, 2012). Francesca Modena gratefully acknowledges the financial support of Fondazione Caritro and of the Autonomous Province of Trento (OPENLOC research project). The opinions expressed in this chapter are those of the authors and do not necessarily reflect those of the Bank of Italy.

Notes

1 The question is available for the period 1995–2008.

2 In the IDEA sample (Beginning of the adult age, 2004), about 65 per cent of youths living outside the parental home received parental transfers to purchase or rent a house, and this percentage increased to 72 per cent for the sample of youth aged 23–27 (Mencarini and Tanturri 2006).

3 Our approach most resembles that used in Parisi (2008) to analyse the link between the poverty status of young people who leave home and the economic status of their family of origin using a competing risk duration model. Althought the survival time is discrete in both cases, our underlying transition process from time $t-1$ to t is assumed to be discrete.

4 The Survey also includes a direct question on the household members who left the house between wave $t-1$ and t. Results are unchanged using this alternative definition. Unfortunately, the Survey does not follow the youth who leaves the parental home.

5 The database makes available to the public a broad range of statistical indicators; it is available at www.bancaditalia.it/statistiche/basi-dati/bds/index.html.

6 More precisely, households were asked: 'Here is a list of qualities that children can be encouraged to learn at home. Which, if any, do you consider to be really important?'

Apart from citing tolerance and respect for other people, imagination, hard work, determination, perseverance, feeling of responsibility as possible answers, the questionnaire included independence as a value that children can be encouraged to learn at home.

7 If the youth is a woman, the sex ratio is calculated as male population over total population.

8 Unfortunately, the survey does not provide information about those who have already left home.

9 The head of household is defined as the person primarily responsible for the household economic budget.

10 All other variables are at their mean.

11 Marginal effects of house prices (rents) are –0.02 (–0.32) and –0.04 (–0.62) for male and female respectively, to be compared with those reported in Table 9.2.

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10 Leaving home and poverty before and after the economic crisis in southern European countries

Fernanda Mazzotta and Lavinia Parisi

Introduction

This chapter follows and updates an empirical study of Parisi (2008) about the link between the poverty status of young people who leave home and the economic status of their family of origin. It is motivated by three stylized facts. First of all is the need to depict the effect of the economic crisis on leaving home and poverty in the southern European countries. Figure 10.1 shows that there are differences before and after 2008 in the probability of living in the parental home. In particular, it seems that after the economic crisis the share of young southern Europeans staying at home increases. This pattern is completely different from that observed for their northern counterparts such as the UK. Given the data restriction, we can only consider the first part of the economic crisis following the 2008 subprime crisis in the US and we have to disregard the sovereign debt crisis that affected Europe after 2010.

In fact, the starting point of the financial crisis was the 2008 subprime crisis in the US causing 465 bank failures between 2008 and 2012. European countries faced a major economic recession in 2009, followed by the current sovereign debt crisis from 2010. The 2009 economic crisis gave incentives to all European countries to increase their public debt to limit the detrimental effects of the crisis itself. To do so, they implemented tax reductions and increases in public expenditure to support aggregate demand in line with the Keynesian principles (i.e. government should intervene through fiscal policy to weaken any crisis affecting aggregate demand). Some European countries have also increased their public debt to save large domestic banks from failure through an increase in the money supply. Ireland was the most dramatic case from this perspective. All this led to a worsening of the economic situation in 2011 because of the sovereign debt crisis, and consequently it also led to loss of trust by foreign investors. Most European countries already had a high level of debt before the financial crisis. The ratios of public debt to GDP in 2007 were 64.2 per cent in France, 65.2 per cent in Germany, 44.2 per cent in the UK, 107.4 per cent in Greece (all figures from Eurostat). With the economic crisis and Keynesian policies, these ratios rose in 2010 to 82.3 per cent in France, 82.5 per cent in Germany, 79.4 per cent in the UK, 148.3 per cent in Greece, 115.3 per cent in Italy and 96.2 per cent in Portugal. In Spain it rose in 2013 to 92.1 per cent. The rise in public

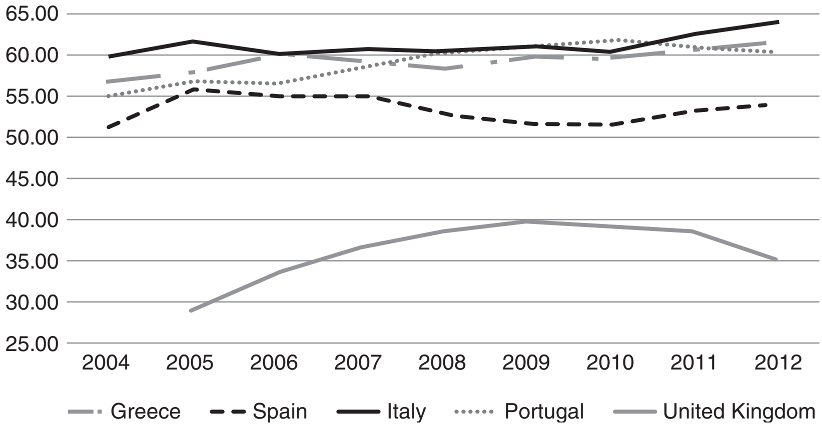

Figure 10.1 Percentage of individuals aged 18–39 living with their parents

Source: Eurostat

debt has dramatically hampered the budgetary situation of many European countries, in particular for the PIIGS countries: Portugal, Ireland, Italy, Greece and Spain. The additional debt resulting from the financial crisis has led to major difficulties for countries financing their debt. This constitutes an economic problem as it forces European countries to make every effort to gain trust *vis-à-vis* investors by reducing their public deficits through restrictive fiscal policies, (i.e. reducing public expenditure and increasing taxes) in a period where the economic crisis had already reduced consumption and private expenditure. The sovereign debt crisis proceeded are as follows: in spring 2010 Greece claimed economic help from the European Union and International Monetary Fund, follwed in April 2011 by Portugal and in November 2011 by Ireland; in July 2011 the Private Sector Involvement (PSI) plan was launched to support Greece. Following the PSI and the sovereign debt crisis, Italy went back into recession in 2011 (Blundell-Wignall 2012; Neri and Ropele 2013).

Secondly, young people in southern European countries (SECs) leave home much later than do young people in other European countries. According to Eurostat data, in 2012, the mean age for men was 31 years in Italy and 30 years in Spain, Portugal and Greece; for women, 28 in Spain, Portugal and Greece and 29 in Italy. In the UK, by contrast, the mean age of young men leaving home is 24.7 and of young women 23. Figure 10.2 plots the mean age at leaving home between 2003 and 2012 for SECs and the UK. Delayed nest-leaving has important economic consequences, as it may affect young adults' reservation wages, their participation rates and their wage trajectories.

Finally, it is well known that poverty is intergenerationally transmitted, thus individuals from an economically deprived background have fewer opportunities in the labour market (Farace *et al*. 2014). If so, young people from poorer families have a higher probability of being poor after leaving home than youths from better-off families (Ayllón 2014).

Figure 10.3 shows the percentage of young Europeans at risk of poverty, using the AROPE indicator that includes the risk of poverty (i.e. the percentage of people below the poverty threshold, which is set at 60 per cent of the national equivalized disposable income after social transfers, the percentage of people in a situation of severe material deprivation and finally the percentage of people living in a household with very low work intensity). The percentage of people at risk of poverty (aged 18–24) increased dramatically in all the five countries after 2008. The worst condition, considering the difference between the highest and the lowest figure of the period under consideration, is for Greece and Spain.

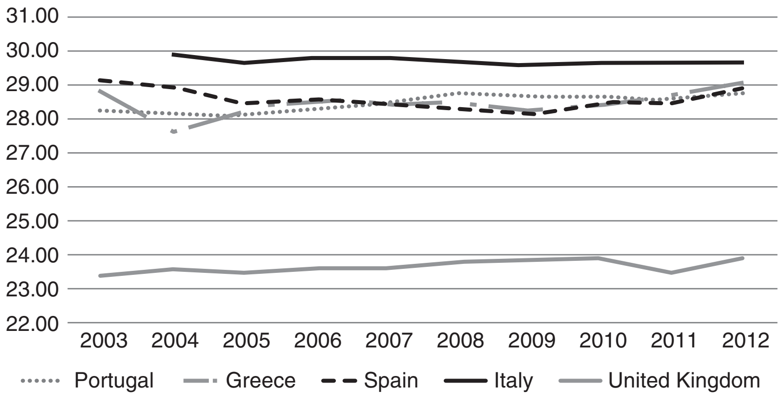

Figure 10.2 Mean age at leaving home

Source: Eurostat

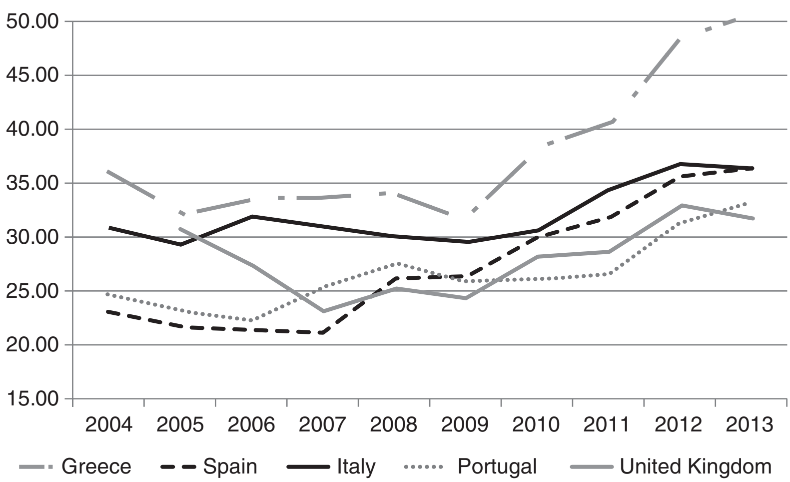

Figure 10.3 Percentage of people aged 18–24 at risk of poverty and social exclusion (AROPE)

Source: Eurostat

When examining young people leaving home in SECs, we adopt a wider age range than in most studies on youth poverty. Therefore, the definition of 'young people' in this chapter differs from that generally used in the literature. Young people are usually 'those who are no longer children, but who belong to an age group many of whose members have not yet completed all the processes of transition to adulthood' (Aassve *et al*. 2005). Youth is usually considered as starting around 15 years old and ending around 25.[1] In this paper, young people are aged 18–34 years and have completed most of the steps of transition to adulthood, namely leaving the parental home and forming a partnership.

There are several reasons why young southern Europeans leave home later than their northern European counterparts. The decision could be driven by factors such as a high rate of unemployment or high housing prices (Ermisch 1999; Giannelli and Monfardini 2003; McElroy 1985). However, those factors are not considered here. In addition, living in the parental home may increase the utility of both parents and children. On the one hand, children may prefer to live in their parental home because their income is higher than it would be if they were to leave home and because of the care provided by their parents. On the other hand, parents may greatly value having children at home longer and so offer inducements to keep their children at home as long as possible (Manacorda and Moretti 2006). Also young adults may stay at home in order to help to reduce the poverty risk of their parents (Cantó and Mercader-Prats 2001; Sanchez and Mercader-Prats 1998) and to provide care for their aged parents. Leaving home is strongly correlated to employment conditions, and the length of time that a young person is unemployed influences also the time she/he remains in the parental home. Moreover, leaving home typically occurs at the same time as partnership formation: the median age of leaving home and partnering is the same in SECs (Iacovou 2010). Thus we need to control for marital status when analysing leaving home transitions.[2]

Many studies find a strong link between leaving home and youth poverty and emphasize that leaving home is more important in explaining poverty among young people than other factors such as employment, presence of children or cohabitation. Aassve *et al*. (2005) found that young southern Europeans delay leaving home because they know that they are more likely to enter poverty than those who decide to stay in the parental home. Across countries, the higher the proportion of youth (aged 20–24) leaving home, the bigger the gap in poverty rates between those at home and those leaving. Thus, it seems important to analyse youth poverty and leaving home simultaneously.

The poverty status of young people after leaving home may be affected by all those variables that influence earnings, such as education (Becker 1965; Mincer 1974), gender (Bettio 2008), health, financial pressures (Blau and Kahn 1996) and labour market conditions.[3] However, the focus of this chapter is family background. It influences both the duration of unemployment among young people – consequently the permanence in the parental home – and the expected earnings of young people – consequently the poverty status after leaving (Farace *et al*., 2014).

Our contribution is to look at the effect of parental income on young people's poverty status, conditional on whether they have left home. Unlike previous research, the study also provides some preliminary results on the effect of the economic crisis on poverty status and leaving home. The main aim of the chapter is to look at the relationship between parental income and poverty status after leaving home using an updated sample of young people in SECs. We do not claim to show any causal impact of the economic crisis on the variables of interest, nevertheless we can depict the SEC situation with regard to leaving home and poverty given that the sample of young people (drawn from the European Union Statistics on Income and Living Conditions (EU-SILC))[4] covers a period between 2004 and 2010. Moreover, the longitudinal aspect of the survey allows us to follow people for at least a year to consider the transition into and out of poverty and into and out of the parental home. As already mentioned, given data restriction, we can only consider the first part of the economic crisis following the 2008 subprime crisis in the US, and we have to disregard the sovereign debt crisis that affected Europe after 2010.

This chapter focuses on a subsample of young people who have left home, in order to analyse youth poverty after leaving home. There may be an association between parental income and leaving home: the higher the parental income, the less likely a youth is to leave home or vice versa. This suggests a potential sample selection bias because there are some observable and unobservable factors that determine whether a young person has left the parental home and, at the same time, affect the outcome of primary interest (youth poverty status). We use a standard sample selection model in order to address this issue.

The estimates show that leaving home is associated with a higher chance of having low income: there is a positive association between the probability of leaving home and the probability of being poor. Moreover, the poorer the family of origin, the more likely it is that the leaver will be poor. Higher chances of being poor are associated with having lower educational qualifications: one explanation might be that remaining in the parental home longer increases the chances of getting a higher educational qualification and hence a better paid job. Moreover, there appear to be differences in the various patterns across the four SECs studied. Finally, the economic crisis seems to affect the probability of leaving home but not the probability of poverty and it seems that it worsens the Italian situation among SECs.

The chapter is structured as follows. In the next section we describe the theoretical and empirical literature on the effect of parental characteristics on income and leaving home. Then we describe our methodology and summarize the data. After presenting our results, we offer some conclusions.

Parental characteristics, leaving home and poverty

Family background influences the duration of unemployment among children and consequently the permanence in the parental home (Farace *et al*. 2014). The theoretical and empirical literature defines three channels of transmission: the family's financial and cultural circumstances (such as education) and family networks. The first two channels affect both the opportunity to access better education and support children's job search efforts. At the micro level, economic theory (Becker 1975) provides a framework to analyse the association underlying the positive correlations between parents' and children's education and consequently parents' and young people's income. The intergenerational mobility literature has explored this link. With respect to education, empirical studies show that wealthier families can afford high-quality schools for their children (Checchi and Zollino 2001). Regarding earnings, the strong link between parents' and children's incomes means that Italy is one of the least mobile OECD countries, trailing only the UK in terms of 'intergenerational earnings elasticity' (Checchi *et al*. 1999; Mocetti 2007; OECD 2009).

Family background can also influence the reservation wages of offspring, accepted starting salaries and the decision whether to accept a given wage offer. For instance, high family income enables parents to provide financial support during their offspring's employment search. According to standard job search theory, increased benefits during this search raise the young person's reservation wage and accepted starting salary. Consequently, wealthier families can mitigate liquidity constraints, allowing their children to devote less effort to and extend the job search process (i.e. allowing them to be unemployed for a longer period) to achieve a better match in the labour market. However, individuals from less advantaged families are credit constrained; hence, they might be forced to accept any job offer to reduce their unemployment duration. This interpretation would suggest a positive relationship between higher family socioeconomic status and unemployment duration and thus delay in leaving the parental home. Clearly, financial support and education are not the only channels through which family members can influence the employment prospects of their children. In the Italian case, networks play an important role by providing information on the quality of education and jobs, thereby increasing the children's opportunities. Farace *et al*. (2014) analyse the unemployment duration of children as affected by their family background. They find a residual effect of parental economic conditions on unemployment duration that could be the result of educational quality and/or network effects. Children from the wealthiest families may be able to afford high-quality school and university and also may have better information and search strategies, thus reducing their unemployment duration. According to these statistics leaving home is positively correlated with the probability of finding a job (Mazzotta and Parisi 2015), thus higher family income can have an ambiguous effect on the unemployment duration (Mazzotta 2007) and consequently on leaving home, speeding up or delaying entry into the job market.

Several studies have analysed both theoretically and empirically the effect of parental income on the probability of staying in or leaving the parental home. Parents prefer to have children at home if their income is low and parents need to transfer money to them. This is because the monetary transfer costs are lower when the children live at home; moreover, in the US cohabitation rates tend to fall as parental income rises. This would suggest that for US parents privacy is accepted as important (see Rosenzweig and Wolpin 1993, 1994).

On the other hand, if parents are assumed to be partially altruistic towards their children, they will provide financial help to an independent child when his/her income is low. Nevertheless, children of altruistic parents have a lower income threshold for independence than those with more selfish progenitors, thus those in the first case are more willing to leave (Becker *et al*. 2005).

A study for the UK suggests that parental income positively influences the decision to leave home only if the parents have a high preference for cohabitation. On the contrary, if children are relatively poor with respect to parents, parental income may have a negative effect on the probability of leaving (Ermisch 1999).

Thus theoretical models allow for both positive and negative effects of parental income on nest leaving. This depends on the way in which parents express their altruism when the child coresides and when he/she lives independently. Angelini and Laferrère (2012) distinguish two channels for parental altruism: the first considers parental help in paying the child's expenses when independent. The second considers subsidizing consumption when he/she coresides more than would be the case under independence, because of a higher altruism in the former situation, or because it is cheaper to transfer in that case.

Finally, Iacovou (2010) represents the closest study to our analysis. She examines the factors influencing young people's decision to leave the parental home in Europe, focusing on the role of income: the young person's own income, and that of his/her parents. She uses a logit model when departures from the parental home are considered as a single category, and a multinomial logit when three different destinations on leaving home are included: leaving as a single person; leaving in order to live with a spouse or partner; and leaving for educational purposes. In all groups of countries, the young person's own income is positively associated with the probability of leaving home. However, the effects of parental income are more complex. Everywhere, higher parental income is associated with a lower likelihood of leaving home to live with a partner at young ages, and a greater likelihood at older ages. But whereas in Nordic countries higher parental incomes accelerate home leaving to partnership at all ages after the late teens, this effect is not seen until a much later age in southern Europe, and not until after age 35 for southern European men. This is consistent with existing theory about cross-country differences in the nature of family ties, suggesting that parents' preferences for independence versus family closeness differ between countries, and contribute (together with differences in young people's socioeconomic situations) to the widely differing patterns of living arrangements observed across Europe.

With regard to the link between poverty status and leaving home, it seems that there is a strong association. Aassve *et al*. (2006), examining annual longitudinal data for 13 European countries, find that poverty and deprivation were generally higher for young adults in the year immediately after they left home than in the year before or for other young adults who remained at home. Parisi (2008), focusing on four SECs, finds that leaving home to live with a partner increased young people's risks of entering poverty in Portugal and Spain but not in Italy and Greece. A more recent study (Ayllón, 2014) uses a dynamic trivariate probit model for poverty, employment and leaving the parental home in Europe. Her model allows for feedback effects between the three processes dealing with the endogeneity problems that arise when studying life transitions which are possibly taking place in a sequential manner. The main results show that economic hardship today increases in itself the likelihood of being poor tomorrow among young individuals. However, in Italy, fewer young people live in economic hardship but they have greater difficulties in leaving it behind. Moreover, her findings show that there is a strong association between poverty and leaving home, and employment and leaving home are closely related phenomena in the cases of Mediterranean and Continental Europe.

There are no studies about the youth poverty condition linked to the decision to leave the parental home considering the period before and after the economic crisis. In a 16-country analysis of the impact on household incomes of the major economic downturn that began at the end of 2007, Jenkins *et al*. (2011) find that although GDP fell during the crisis, gross household disposable income (GHDI) rose between 2007 and 2009 in 12 of them (only in Switzerland, Denmark, Greece and Italy did GHDI fall). The household sector was protected from the impact of the downturn by additional support of governments through the tax and benefit system. Of course, of particular interest should be the result of the analysis after the sovereign debt crisis that affected some countries, such as the PIIGS countries.

Methods

As described above, the chapter focuses on a subsample of young people who have left home, in order to analyse youth poverty after leaving home. There may be an association between parental income and leaving home: the higher the parental income, the less likely a youth is to leave home or vice versa. This suggests a potential sample selection bias because there are some observable and unobservable factors that determine whether a young person has left the parental home and, at the same time, affect the outcome of primary interest (youth poverty status). We use a standard sample selection model in order to address this issue. The empirical model incorporates unobservable factors that influence both the probability of being poor and the probability of leaving home. The model is a type of first-order Markov approach. It takes into account pairs of observations in two consecutive years t and $t+1$ for each individual ($i = 1, \ldots, N$), where t is the year when a young person lives with her/his parents and $t+1$ is the year when she/he has left home. In this analysis an individual must leave home in order to observe income at time $t+1$, therefore a potential selection bias may arise driven by the potential association between income at time t and the inclusion in the subsample. We use a Heckman selection approach in order to address the issue, when estimating the following equation:

$$\begin{aligned}\Pr(y_{t+1} < z_{t+1}) = {} & \beta y_t + \alpha_0 Gender_{t+1} + \alpha_1 Age_{t+1} + \alpha_2 Education_{t+1} + \alpha_3 Health_{t+1} \\ & + \alpha_4 Fraction\ of\ Youth\ Income_t + \alpha_5 Marital\ Status_{t+1} \\ & + \gamma_1 Countries_{t+1} + \gamma_2 Crisis + u_i \end{aligned} \tag{10.1}$$

where z_{t+1} is the poverty line and $\Pr(y_{t+1} < z_{t+1})$ is observed if and only if a second, unobservable latent variable exceeds a particular threshold:

$$\begin{aligned}L^*_{i,t+1} = {} & \beta^* y_t + \alpha_0^* Gender_{t+1} + \alpha_1^* Age_{t+1} + \alpha_2^* Education_{t+1} + \alpha_3^* Health_{t+1} \\ & + \alpha_4^* Fraction\ of\ Youth\ Income_t + \alpha_5^* Marital\ Status_{t+1} \\ & + \alpha_6^* Crowd\ Index_t + \gamma_1^* Countries_{t+1} + \gamma_2^* Crisis + e_i \end{aligned} \tag{10.2}$$

where

$$L_{i,t+1} = \begin{cases} 1 & \text{if } L^*_{i,t+1} > 0 \\ 0 & \text{otherwise,} \end{cases} \tag{10.3}$$

$$\mathrm{Corr}(e,u) = \rho. \tag{10.3}$$

The outcome equation (10.1) is the probability of being poor after leaving home, $\Pr(y_{t+1} < z_{t+1})$. The dependent variable is observed only for a subset of the sample: young people who leave home. Interest is mainly in the association between the poverty status of young southern Europeans after leaving and the income of their former household, y_t. This association is estimated by directly including the economic status of the family of origin (y_t). Other demographic characteristics are also included. The selection equation (10.2) is the probability of leaving home at $t+1(L_{t+1})$. Whether a young person has left home or not is observed for all the individuals in the sample. The probability of leaving home depends on explanatory variables that reflect demographic characteristics. Equation (10.2) also includes a crowding index[5] as an explanatory variable in order to address the identification issue. Children from larger families are more likely to leave home early, and overcrowded accommodation is a factor that raises the chances of moving out of the parental home. The probability of living in a crowded house (i.e. having a small number of rooms and/or a large number of adults) could be negatively associated with parental income. However, we assume that the household size itself at time t (relative to the number of adults with whom the household is shared) is not a factor directly affecting the income at time $t+1$ (after leaving).

We test whether or not the correlation between the error terms (ρ) is significantly different from zero. If it is, standard probit techniques applied to the outcome equation would yield biased information.

Data

The analysis is based on the EU-SILC, a comparable cross-sectional and longitudinal multidimensional data set on income, poverty, social exclusion and living conditions. The EU-SILC project was launched in 2003. Its longitudinal component collects individual changes over time observed over at least a four-year period from 2004 to 2011. The countries analysed are Italy, Spain, Portugal and Greece. The sample consists of young people aged 18–34 years when first observed in the EU-SILC (in year t). For the four countries together, the number of youths who were living with their parents at time t and who were at risk of leaving home is 41,456. A young person is observed for at most four waves (from 2004 to 2011).[6] Each individual may contribute more than one pair–year observation (the two consecutive years t and $t+1$).[7] Four destinations for young people can occur at $t+1$: remaining in the parental home, leaving home to live with a partner, leaving home alone, and no longer present in the panel. The percentage of young people in each destination is presented in Table 10.1.

Table 10.1 Destination at t+1, by country (row percentages)

	At home	*Left home with partner*	*Left home alone*	*Attrition*	*No. of observations*
Italy	89.84%	1.78%	1.21%	7.18%	25,889
Greece	86.48%	1.54%	0.77%	11.21%	4,298
Spain	89.11%	2.24%	1.53%	7.12%	17,231
Portugal	86.55%	2.22%	0.63%	10.60%	7,331
SECs	88.91%	1.96%	1.20%	7.93%	
No. of observations	48,675	1,075	655	4,344	54,749

Source: authors' calculations from EU-SILC data

Few young people leave home in any year (3.12 per cent, i.e. 1,730 young Southern Europeans in our sample). The smallest fraction is in Portugal (2.85 per cent). The country with the highest percentage of young people who leave home is Spain. The sample is characterized by a high rate of panel dropout. The highest rate is in Greece: 11.21 per cent of young people present in the panel at t are not present at $t+1$.

Table 10.2 shows the number of observations in each destination distinguishing before and after the economic crisis. Fewer young people leave home at $t+1$ after the economic crisis, above all in Italy and in Spain. Greece and Portugal seem to show an opposite pattern: the share of people leaving home is higher after the economic crisis than before.

Definitions of key variables: incomes y_t and y_{t+1}

The variable of main interest is income. Income is used to determine the poverty line and all the other income measures used in the regressions. Appendix 10.A describes in detail the method used to construct the income variable.

Net household income is constructed as the sum of net personal income at $t+1$ (all income variables are collected retrospectively). Net household income is divided by a scaling factor taking into account the economies of scale within the household. This scaling factor reflects the number of adults and children among

Table 10.2 Destination at t+1, by country and before and after the economic crisis (number of observations)

	At home			*Left home with partner*			*Left home alone*			*No longer in the panel*		
	All	*Before*	*After*	*All*	*Before*	*After*	*All*	*Before*	*After*	*All*	*Before*	*After*
Italy	23,258	12,552	10,706	460	286	174	313	183	130	1,858	727	1,131
Greece	3,717	860	2,857	66	14	52	33	7	26	482	99	383
Spain	15,355	7,319	8,036	386	216	170	263	115	148	1,227	556	671
Portugal	6,345	2,506	3,839	163	59	104	46	17	29	777	359	418
SECs	48,675	23,237	25,438	1,075	575	500	655	322	333	4,344	1,741	2,603

Source: authors' calculations from EU-SILC data whom the income has to be shared, and it is the modified OECD equivalent scale (provided in the survey). Income has been converted to a common scale using purchasing power parities. The poverty line is set at 60 per cent of the contemporary median equivalent household income, computed using all individuals in each wave and for each country. A young person is considered poor if his equivalized income is below the national poverty line.

When income is used as an explanatory variable (y_t) different specifications of the income measure are provided: a categorical income measure (four dummy variables for different income categories where the boundaries are expressed in terms of fractions of the median, i.e. 60 per cent, 100 per cent, 150 per cent) and a logarithmic transformation of the income.

In addition, as measure of economic status we use a financial hardship indicator. Individuals were asked whether or not (because of a shortage of money) they could afford certain items. These are as follows: ability to pay for a one-week holiday away from home; ability to pay water, heating, electricity, gas or telephone bills on time; ability to pay the mortgage or rent on time; no difficulties with hire-purchase instalments; ability to keep home adequately warm; ability to face unexpected financial expenses; ability to make ends meet. We redefine these variable in dicotomous dummies considering negative responses as hardships. Then we sum all those dummies to form an index of financial hardship (Cobb-Clark and Ribar 2012) – the higher the index, the worse the financial situation of the individual. From this index we also construct a relatively subjective measure of financial hardship: we define a young person as deprived if his index is higher than the national contemporary median.

Descriptive statistics

Poverty transition rates[8] for young people observed in two consecutive years (at t at home and at $t+1$ leaving to live with a partner) are reported in Table 10.3. Taking the four SECs altogether, young people leaving home are more likely to enter than to exit poverty (13.6 per cent of young people enter poverty, while 4.3 per cent exit). Looking at the countries individually, the biggest gap is in Italy, the smallest in Greece. In Italy there is a higher proportion of 'leavers' entering poverty (around 17 per cent), in Portugal the lowest (around 5 per cent). Among those staying at home and for all countries, the percentage of both entry and exit is around 2 per cent. This confirms that staying at home is a protection against poverty.

The relative risks of entry (exit) poverty of a young person who has left home compared to a young person who has stayed at home at $t+1$ are plotted in Figure 10.4.[9] The grey (black) bar is the risk of entering (exiting) poverty for a young person who has left home relative to the risk for a young person staying at home. Looking at the four SECs together, the risk of entry is higher than the risk of exit.[10] The grey bar shows that the proportion of youths entering poverty after leaving is greater than the proportion of youths entering poverty but staying at home. In Portugal there are no big differences between 'stayers' and 'leavers' (i.e. the relative risk of exit is about 1, meaning that leavers are as likely as stayers to exit poverty).

Table 10.3 Poverty transitions rates, by country (column percentages)

	SECs	*Italy*	*Greece*	*Spain*	*Portugal*
Left home at $t+1$					
Non-poor at t but poor at $t+1$	13.6	17.5	16.2	11.6	4.8
	0.008	*0.013*	*0.037*	*0.012*	*0.014*
Poor at t and non-poor at $t+1$	4.3	3.8	5.1	5.2	2.8
	0.004	*0.006*	*0.022*	*0.008*	*0.011*
Non-poor at t and at $t+1$	77.6	72.2	73.7	80.7	90.0
	0.010	*0.016*	*0.044*	*0.015*	*0.021*
Poor at t and at $t+1$	4.5	6.6	5.1	2.5	2.4
	0.004	*0.008*	*0.022*	*0.006*	*0.011*
No. of observations	1,730	773	99	649	209
At home at $t+1$					
Non-poor at t but poor at $t+1$	2.4	2.2	2.3	2.7	2.4
	0.001	*0.001*	*0.002*	*0.001*	*0.001*
Poor at t and non-poor at $t+1$	2.5	2.2	2.7	2.5	3.3
	0.001	*0.001*	*0.002*	*0.001*	*0.002*
Non-poor at t and at $t+1$	82.0	80.7	84.0	82.5	84.4
	0.010	*0.002*	*0.006*	*0.003*	*0.004*
Poor at t and at $t+1$	13.1	14.9	11.1	12.3	9.9
	0.001	*0.002*	*0.005*	*0.002*	*0.003*
No. of observations	48,675	23,258	3,717	15,355	6,345

Note: Sample consists of young people leaving parental home (top panel) at $t+1$ and staying at home at t and at $t+1$ (bottom panel) Standard errors in italics.

Considering SECs all together the risk of entry is three times higher than the risk of exit poverty between leavers and stayers.[11]

Model estimates and implications

We now turn to the estimates for the model, pooling all four SECs and considering three specifications of economic status in the family of origin (y_t).

Three specifications are used in order to control for the potential endogeneity of y_t. The endogeneity may arise because all income measures are constructed at household level. Therefore the correlation between income at t and income at $t+1$ could be driven by the proportion of youth income which contributes to both y_t and y_{t+1}.

The economic status at t is defined as (1) a categorical income measure (based on equivalized income), or (2) the log of total net household income or (3) as a

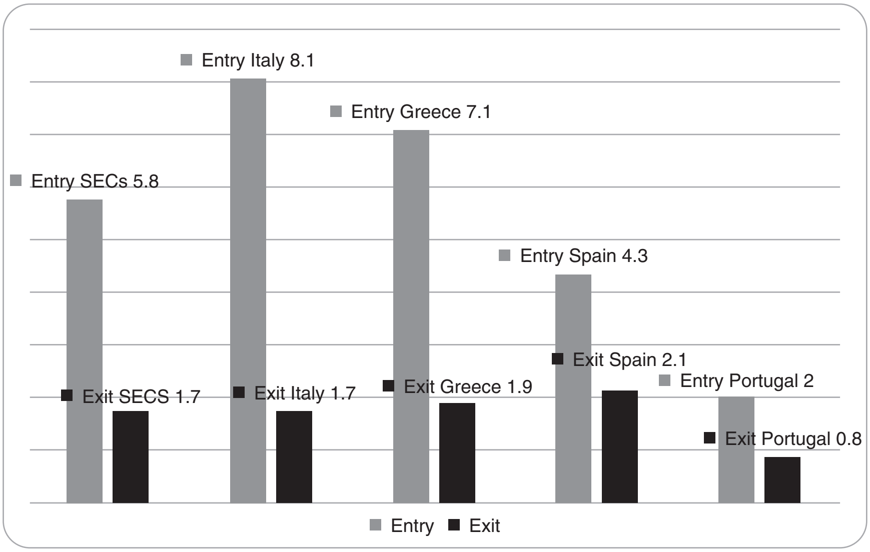

Figure 10.4 Risk of entry (exit) into (out of) poverty for a young person who has left home relative to the risk for a young person who stayed at home

subjective measure of economic status. In this last specification, both the dependent and the independent variable are a measure of subjective deprivation as defined earlier. In order to control for the endogeneity, specification (1) includes as a regressor the income (from labour) of the young person expressed as a fraction of total household income from labour and pension at t. Specification (2) includes the log of personal income from labour. We believe that specification (3) has fewer problems related to endogeneity than (1) and (2); however, given that the financial hardship index is calculated at household level, we include in the regression the income (from labour) of the young person expressed as a fraction of total household income from labour and pension at t as in (1).

Table 10.4 reports results for the outcome equation (i.e. the probability of being poor) without and with Heckman correction. Table 10.5 reports estimates for the selection equation (i.e. the probability of leaving home). Descriptive statistics for all the variables presented in the estimates are provided in Appendix 10.B.

First of all, as shown in Table 10.4, the correlation between the error terms is positive and significantly different from zero in all the specifications. Thus, controlling for observed factors, the more likely a young person is to leave home, the more likely she/he is to be poor. Staying at home is a protection against poverty, in SECs. Moreover, the significance of ρ also means that the estimates with Heckman correction are preferred.

The estimates also show that the poorer the family of origin, the more likely the youth is to be poor at $t+1$. Children from richer families may have better opportunities to find work than children from poorer families. The association also holds when controlling for the effects of education and when including the young person's income expressed as a fraction of total household income at *t*. In specification (2) the log of household income is negatively associated with the probability of being poor at $t+1$ also when including the log of personal income. We look at transition between two periods in time, and it may be reasonable to think that the new family of a young son or daughter (who has left home the year before) has a low income given that he/she is at the beginning of his/her job career. On the other hand, it is likely that the leavers are the ones that are also more likely to find a job so unobservable characteristics such as ability are positively linked to both the outcomes (i.e. leaving home and finding a job; see Mazzotta and Parisi 2015).

We also find that having a secondary educational qualification decreases the probability of being poor at $t+1$, while in specification (1) and (2) graduates are as likely as young people with only compulsory education to be poor after leaving. This could be due to the fact that more highly educated people have a very low salary at the beginning of their career compared with their potential tenure track: our study, in fact, analyses individuals in their first year outside parental home – they could have just started a job so their income could be much lower than their potential income. In specification (3) education is strongly associated with poverty, meaning that the effect of education is also captured by income. Spain and Portugal register a lower risk of poverty than Italy. As Eurostat data have shown (see Figure 10.3) poverty is higher in Italy than in those countries. For Greece the situation is less clear: it seems that there is no difference between Italy and Greece, but the result could be driven by the small sample size.

Table 10.4 includes a dummy to disentangle the effect of the economic crisis on the probability of being poor, and estimates show that after 2008 the probability of being poor is higher (see specification (2)). To look more carefully at this result, however, Table 10.6 reports the estimates considering separately the year before and after the monetary crisis of 2008. The marginal effects are presented in Table 10.6; the estimate on parental income confirms the results in Table 10.4. We test whether the two estimates are different in the two samples considered. We find that the effect of parental income after 2008 is higher than the effect of parental income before the crisis (i.e. having a household income below the poverty line increase the probability of being poor by 42.8 percentage points before 2008 and 73 percentage points after 2008).

We test the goodness of fit considering separated vs. pooled estimates, performing the Hausman test: this tests the equality of the common coefficient across two equations (i.e. before and after the economic crisis). For the equation related to the risk of poverty, we cannot reject the assumption of equal coefficients, while the opposite is true for leaving home equations, and this means that it is better to consider two separate estimates. Moreover, we test the significance of each variable through the interaction variable (multiply each variable by the dummy after crisis). Finally, we also perform a likelihood ratio test comparing the separate, unrestricted model (before and after the economic crisis) against the pooled, restricted model and we find that the first one is to be preferred.

Looking at estimates of equation (10.2) (probability of leaving home) in Table 10.5, we can say that leavers are young people from better-off families (in line with Parisi 2008) and with higher education.[12] Those children, in fact, may find jobs more quickly thanks to the fact that their parents are able to finance their

Table 10.4 Probability of being poor at t +1, pooled model for SECs (marginal effect)

	Without Heckman correction			*With Heckman correction*		
	Fraction of income	*Log of income*	*Financial Hardship*	*Fraction of income*	*Log of income*	*Financial Hardship*
Eqinc under 60%Me	0.545			0.537***		
Eqinc between 60%&100%Me	0.251***			0.227***		
Eqinc between 100%&150%Me	0.062***			0.053***		
Log of eq. income at t		–0.086**			–0.082**	
Financial hardship			0.241***			0.207***
After 2008	0.017	0.034*	–0.002	0.016	0.033*	–0.015
Tertiary education at t +1	–0.015	–0.037	–0.026***	0.011	–0.024	–0.144***
Secondary education at t +1	–0.040**	–0.048**	–0.132***	–0.032*	–0.045**	–0.112***
Male	0.015	–0.001	–0.003	0.006	–0.003	–0.033
Age	0.010	0.005	–0.004	0.037*	0.016	0.051
Age squared	0.000	0.000	0.000	–0.001*	0.000	–0.001
Good health at t	–0.013	–0.015	–0.077*	–0.013	–0.012	–0.071
Married at t +1	–0.120***	–0.119***	–0.107***	–0.106***	–0.118***	–0.108***
Spain	–0.058***	–0.086***	–0.001	–0.047***	–0.081***	0.005
Greece	–0.035	–0.060*	0.076	–0.032	–0.058*	0.080
Portugal	–0.092***	–0.142***	–0.179***	–0.078***	–0.136***	–0.168***
Fraction of youth income at t	–0.566***		–0.302***	–0.486***		–0.289***
Log of personal income at t		–0.033***			–0.031***	
N	1,730	1,730	1,730	1,730	1,730	1,730
ll	–578.21	–628.43	–935.69	–5,448.96	–5,490.34	–5,867.23
Wald χ^2	328.83	269.66	255.25	404.19	216.65	318.01
obs. P	18.09%	18.09%	31.10%			
pred. P (all sample)	37.04%	39.04%	43.66%	37.53%	39.24%	44.30%
pred. P (youth left home)	11.03%	13.39%	28.6%	9.28%	12.83%	26.31%

Notes. Income fractions are based on equivalized income (EI); the reference category is EI above 150% of the median. Other reference category: compulsory education; Italy. Standard errors adjusted for 41,456 clusters in the full sample 1,729 clusters considering only youths who left home.

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Table 10.5 Probability of leaving home at t +1, pooled model for SECs (marginal effect)

	Without and With Heckman correction		
	Fraction of income	*Log of income*	*Financial Hardship*
Eqinc under 60%Me	–0.013***		
Eqinc between 60%&100%Me	–0.009***		
Eqinc between 100%&150%Me	–0.006***		
Log of eq. income at t		0.005***	
Financial hardship			–0.004***
After 2008	–0.001	–0.001	–0.001
Tertiary education	0.013***	0.012***	0.018***
Secondary education	0.002	0.002	0.003**
Male	–0.002	–0.002*	–0.001**
Age	0.006***	0.005***	0.007***
Age squared	0.000***	0.000***	0.000***
Good health at t	0.004***	0.004***	0.005***
Married at t +1	0.374***	0.369***	0.373***
House crowded at t	0.000	0.003***	0.002*
Spain	0.000	0.000	–0.001
Greece	–0.007***	–0.005***	–0.008***
Portugal	–0.008***	–0.005***	–0.008***
Fraction of youth income at t	0.030***		0.028***
Log of personal income at t		0.002***	
N	50,405	50,405	50,405
obs. P	3.43%	3.43%	3.43%
pred. P	1.28%	1.22%	1.37%
rho	0.732***	0.331**	0.671***

Notes. Income fractions are based on equivalized income (EI); the reference category is EI above 150% of the median. Other reference category: compulsory education; Italy. Standard errors adjusted for 41,456 clusters in the full sample 1,729 clusters considering only youths who left home.

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Table 10.6 Probability of being poor at $t+1$, pooled model for SECs before and after the economic crisis (marginal effect)

	Fraction of income		*Log of income*		*Financial Hardship*	
	Before	*After*	*Before*	*After*	*Before*	*After*
Eqinc under 60%Me	0.428***	0.730***$$				
Eqinc between 60%&100%Me	0.172***	0.286***$$				
Eqinc between 100%&150%Me	0.044	0.053*				
Log of eq.income at t			–0.055	–0.148***$$		
Financial hardship					0.247***	0.183***
Tertiary education at $t+1$	0.026	–0.006	0.0027	–0.045	–0.004	–0.029***$$$
Secondary education at $t+1$	–0.027	–0.041*	–0.033	–0.057*	–0.122*	–0.012***
Male	0.016	–0.005	0.0042	–0.012	–0.004	–0.007**$
Age	0.030	0.050**	0.0286	0.025	0.093*	–0.007
Age squared	–0.001	–0.001**	–7E–04	0.000	–0.002**	0.000
Good health at t	0.011	–0.031	0.0025	–0.015	–0.109*	–0.034
Married at $t+1$	–0.130***	–0.080***	–0.128***	–0.112***	–0.125***	–0.108*
Spain	–0.073***	–0.027***	–0.095***	–0.063**	0.029	–0.060
Greece	0.074	–0.047	0.0723	–0.091***$	0.076	0.050
Portugal	–0.102***	–0.046**	–0.136***	–0.132***	–0.150*	–0.192***
Fraction of youth income at t	–0.455***	–0.518***$$			–0.244***	–0.345***
Log of personal income at t			–0.027***	–0.039***$$		
N	897	833	897	833	897	833
ll	–2,772.52	–2,644.1	–2,786.14	–2,671.78	–2,969.573	–2,864.57
Wald χ^2	159.77	262.22	129.25	138.31	226.51	113.12
obs. *P*	18.62	17.53	18.62	17.53	33.00	29.05
pred. *P* (all sample)	36.71	38.86	37.75	42.91	45.44	43.75
pred. *P* (youth left home)	11.05	6.84	12.89	11.90	27.53	24.99

Notes. Income fractions are based on equivalized income (EI); the reference category is EI above 150% of the median. Other reference category: compulsory education; Italy. Standard errors adjusted for 18,251 (24,605) clusters in the full sample and 897 (833) clusters considering only youths who left home before crisis (after crisis).

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Test whether the difference before and after the crisis is significant $ $p < 0.1$; $$ $p < 0.05$; $$$ $p < 0.01$

Table 10.7 Probability of leaving home at $t+1$, pooled model for SECs before and after the economic crisis

	Fraction of income		*Log of income*		*Financial hardship*	
	Before	*After*	*Before*	*After*	*Before*	*After*
Eqinc under 60%Me	–0.012***	–0.013***				
Eqinc between 60%&100%Me	–0.007***	–0.010***				
Eqinc between 100%&150%Me	–0.004***	–0.006***				
Log of eq. income at *t*			0.005***	0.005***		
Financial hardship					–0.001	–0.006***$$
After 2008						
Tertiary education	0.012***	0.013***	0.011***	0.012***	0.016***	0.019***
Secondary education	0.000	0.003*	0.000	0.003*	0.002	0.004**
Male	–0.003*	–0.001	–0.002	–0.001	–0.002	0.000
Age	0.008***	0.004***	0.007***	0.003*	0.009***	0.006***
Age squared	0.000***	0.000***	0.000***	0.000**	0.000***	0.000***
Good health at *t*	0.007***	0.001$	0.007***	0.001	0.008***	0.002$
Married at $t+1$	0.400***	0.349***$$$	0.399***	0.339***$$$	0.398***	0.350***$$$
House crowded at *t*	–0.001	0.000$	0.003	0.004***$	0.001	0.003*$
Spain	–0.002	0.002$$$	–0.001	0.001$$	–0.002	0.001$$$
Greece	–0.009***	–0.005***	–0.008***	–0.003*	–0.010***	–0.006***
Portugal	–0.011***	–0.006***$$$	–0.010***	–0.002$$$	–0.011***	–0.005***$$$
Fraction of youth income at *t*	0.029***	0.030***			0.027***	0.028***
Log of personal income at *t*			0.002***	0.002***		
N	24,134	26,271	24,134	26,271	24,134	26,271
obs. p	3.72	3.17				
pred. p	1.42	1.12	1.39	1.02	1.50	1.23
rho	0.6034*	0.7734***	0.4675**	0.0392	0.778***	0.165

Notes. Income fractions are based on equivalized income (EI); the reference category is EI above 150% of the median. Other reference category: compulsory education; Italy. Standard errors adjusted for 18,251 (24,605) clusters in the full sample and 897 (833) clusters considering only youths who left home before crisis (after crisis).

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Test whether the difference before and after the crisis is significant $^{\$} p < 0.1$; $^{\$\$} p < 0.05$; $^{\$\$\$} p < 0.01$

job search and they may have better networking (as found by Farace *et al*. 2014). Moreover, just as leaving home increases with age and good health, children living in crowded accommodation are also more likely to leave home. Men are more likely to stay in the parental home, as in Parisi (2008). The highest effect on the probability of leaving home comes from marital status: married young people are 37 percentage points more likely to leave home. Looking at the dummy on economic crisis, it seems that there is no difference in the probability of leaving home before and after 2008. As well as for the probability of being poor, we provide separate estimates for the probability of leaving home before and after the economic crisis (see Table 10.7). In particular, we find a significant difference in the coefficient in the two estimates: for instance, after the economic crisis marital status reduces its effect, as well as the health status and the country dummies (Spain and Portugal) that are a proxy for institutional factors. In particular, young people in Spain after 2008 are more likely than those in Italy to leave home. Finally, Italy is the country that is most affected by the economic crisis. In fact, even though the marginal effects reduce in the estimate after 2008, they are still significant.

The estimated probability of being poor (corrected for the selection bias) in the overall sample increases after the economic crisis. If we consider the same probability for the subsample of young people who have left home at $t+1$, we can see that it has decreased (see Table 10.6). This result indicates that if the young people at home had left home at $t+1$, the risk of poverty for them would have been even higher. In effect, the economic crisis decreases the probability of leaving home.

Conclusion

The aim of this chapter was threefold. First of all, we tried to depict the effect of the economic crisis on leaving home and poverty, given that descriptive statistics have shown that after 2008 young people are more likely to be poor and less likely to leave home (Figures 10.1 and 10.3). We found that after 2008 the probability of being poor is higher. Second, we tried to analyse the reason why young people in southern European countries leave home at much later ages than do young people in other European countries. The analysis was consistent with the hypothesis that young people delay leaving home because leaving may lower their income. The hypothesis was confirmed by the estimates from the sample selection model, where the more likely a young person is to leave home, the more likely she/he is to be poor after leaving. Finally, recent literature finds that poverty is intergenerationally transmitted, thus individuals from an economically deprived background have fewer opportunities in the labour market (Ayllón 2014; Farace *et al*. 2014). Our study provides evidence that the poorer the family of origin, the more likely it is a young person will be poor after leaving home. Assuming that education of offspring is positively correlated with parental income, the association between parental economic status and the probability of being poor after leaving home also works through the indirect channel: the more educated a youth is, the less likely it is they will be poor if they leave home. Moreover, we find that when analysing the subjective measure of economic status, education has a stronger effect.

Given our data restriction, we could only look at young people who have just left home. They are people at the beginning of their career and with a lower income than their family of origin. Government policy should provide financial assistance to young adults the first year or two of living away from the parental home, given that young people who have just left home are a group at particular risk of poverty, and in particular need of support.

Notes

1 International organizations, such as the United Nations and the European Union, have adopted a definition of youth based on upper and lower age limits. They define young people as individuals between 15 and 24 years of age. However, the most appropriate way to address this issue is to find a definition that is suitable for the analysis and the countries that one wishes to analyse.
2 We are able to distinguish between young people leaving home alone from those who leave home to enter a partnership but the sample size is greatly reduced, so we have decided to consider both the transitions together and include a dummy variable that indicates whether the young individual is in a partnership.
3 A demand effect kept by country effects and dummy crisis.
4 The EU-SILC data were provided by Eurostat. Responsibility for the results and conclusions of this chapter lies with the researchers alone and not with Eurostat, the European Commission or any of the national authorities whose data have been used.
5 The crowding index is defined as the number of adults divided by the number of rooms in the household, excluding the kitchen and bathroom.
6 For example, a young person present in the panel for all four waves is characterized by three pair–year observations (2004–5, 2005–6 and 2006–7).
7 Pooling the four countries and the individual–pair–year observations, the sample has 54,749 observations. In the sample selection approach, attrition is ignored and the sample reduces to 50,405.
8 There are four categories: young people poor both at t and at t+1; young people poor at t and non-poor at t+1 (i.e. exiting poverty); young people non-poor at t and poor t+ 1 (i.e. entering poverty); and young people never poor.
9 Figure 10.4 is based on results from Table 10.3: for example, entry risk for SECs are calculated as the ratio between the percentage of people entering poverty who left home compared to those who stayed at home at t+1 (13.6/2.4=5.7).
10 The biggest difference is in Italy where a young person who has left home is four times as likely to enter poverty as to exit.
11 Odds of entry divided by odds of exit, i.e. 5.8/1.7 for SECs.
12 Living in a poor family (equivalized income under 60 per cent of the median) decreases the probability of leaving home by 1.3 percentage points; graduate young people are 1.2 percentage points more likely to leave home.

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Appendix 10.A: Definition of income

EU-SILC includes many income variables for each household. For instance, the total net household income (the sum of the income of each member of the family from earnings, private and state benefits, and other sources) or the personal net income (the income of each member of the household). All income variables are collected retrospectively, and so each wave contains information on the income received over the previous calendar year. The analysis is based on the comparison between two points in time (before and after a young person has left home) and focuses on young people who are more likely to leave home, and the panel, than older people. The estimates can be very sensitive to the way in which the income variable is constructed. We cannot use the total net household income because household composition changes from year to year so it can include the personal income of some individuals who are no longer in the household. Thus we follow the approach suggested by Iacovou (2004), constructing the net household income in each year t as the sum of the net personal income, reported at $t+1$, of individuals present in the household at t. This approach could lead to a number of missing values on the income variable because of attrition. We could face three situations: (1) all members of the household are present for two consecutive years in the panel; (2) one member of the household is not present in the panel at $t+1$; (3) all members of the household (i.e. the household itself) are not present in the panel at $t+1$. In order to avoid a large number of missing values, we used the following procedure: in case (1), the most likely, we constructed the household income in each year t as the sum of the net personal income reported at $t+1$; in case (2) we constructed the household income as above but imputing the income reported at t to the member who is not present at $t+1$; and in case (3) we generated a missing value.

Moreover the personal income used here is calculated using the personal income from labour or pension provided in the survey at personal level plus the capital income at household level.

Appendix 10.B: Descriptive statistics

Table 10.B1 All individuals in all years considered, distinguishing between all youths and those who have left home

	All youths sample				*Left home*			
	Mean	*SD*	*Min*	*Max*	*Mean*	*SD*	*Min*	*Max*
pov *t*1	0.16	0.36	0	1	0.18	0.39	0	1
LHome	0.03	0.18	0	1	1.00	0.00	1	1
Frpov1	0.15	0.36	0	1	0.09	0.28	0	1
Frpov2	0.29	0.46	0	1	0.25	0.43	0	1
Frpov3	0.32	0.47	0	1	0.34	0.47	0	1
Frpov4	0.23	0.42	0	1	0.32	0.47	0	1
Eqinc *t*	17,104	10,514	0	212,000	19,360	10,463	0	149,000
Finhard *t*	0.38	0.48	0	1	0.35	0.48	0	1
Aftercr	0.52	0.50	0	1	0.48	0.50	0	1
TerEd *t*	0.18	0.38	0	1	0.33	0.47	0	1
SecondEd *t*	0.50	0.50	0	1	0.39	0.49	0	1
TerEd *t*1	0.21	0.41	0	1	0.35	0.48	0	1
SecondEd *t*1	0.52	0.50	0	1	0.39	0.49	0	1
Male	0.54	0.50	0	1	0.48	0.50	0	1
Age *t*	24.36	4.54	18	34	26.98	3.98	18	34
Agesq *t*	614.15	230.35	324	1,156	744.00	211.70	324	1,156
age *t*1	25.35	4.55	18	36	28.02	3.99	18	36
agesq *t*1	663.34	239.83	324	1,296	801.02	220.89	324	1,296
goodhealth *t*	0.91	0.29	0	1	0.93	0.25	0	1
goodhealth *t*1	0.91	0.29	0	1	0.93	0.26	0	1
Spain	0.32	0.47	0	1	0.38	0.48	0	1
Greece	0.08	0.26	0	1	0.06	0.23	0	1
Portugal	0.13	0.34	0	1	0.12	0.33	0	1
FrIncome *t*	0.20	0.21	0	1	0.32	0.21	0	1
PerIncome *t*	6,983.51	8,005.62	0	1.50E+05	12,275.48	8,162.13	0	73,881
status *t*1	0.05	0.22	0	1	0.62	0.49	0	1
Crowd *t*	1.17	0.43	0.13	3	1.20	0.47	0.19	3
N	50,405				1,730			

Table 10.B2 Individuals before the economic crisis (2009), distinguishing between all youths and those who have left home

	All youths sample				*Left home*			
	Mean	*SD*	*Min*	*Max*	*Mean*	*SD*	*Min*	*Max*
pov *t*1	0.04	0.19	0	1	0.19	0.39	0	1
LHome	0.15	0.36	0	1	1.00	0.00	1	1
Frpov1	0.15	0.36	0	1	0.10	0.30	0	1
Frpov2	0.29	0.45	0	1	0.26	0.44	0	1
Frpov3	0.32	0.47	0	1	0.35	0.48	0	1
Frpov4	0.23	0.42	0	1	0.30	0.46	0	1
eqinc *t*	16,568	10,128	0	194,000	18,131	9,209	0	71,405
finhard *t*	0.36	0.48	0	1	0.36	0.48	0	1
aftercr	0.00	0.00	0	0	0.00	0.00	0	0
TerEd *t*	0.17	0.38	0	1	0.30	0.46	0	1
SecondEd *t*	0.50	0.50	0	1	0.39	0.49	0	1
TerEd *t*1	0.20	0.40	0	1	0.33	0.47	0	1
SecondEd *t*1	0.53	0.50	0	1	0.40	0.49	0	1
male	0.54	0.50	0	1	0.48	0.50	0	1
age *t*	24.43	4.53	18	34	26.94	3.97	18	34
agesq *t*	617.18	230.28	324	1,156	741.45	211.19	324	1,156
age *t*1	25.41	4.54	18	36	27.95	3.98	18	36
agesq *t*1	666.04	239.31	324	1,296	796.80	219.40	324	1,296
goodhealth *t*	0.90	0.30	0	1	0.93	0.25	0	1
goodhealth *t*1	0.90	0.29	0	1	0.93	0.25	0	1
Spain	0.32	0.47	0	1	0.37	0.48	0	1
Greece	0.04	0.19	0	1	0.02	0.15	0	1
Portugal	0.11	0.31	0	1	0.08	0.28	0	1
FrIncome *t*	0.20	0.21	0	1	0.31	0.20	0	1
PerIncome *t*	7,166.22	7,976.62	0	1.50E+05	11,672.83	7,652.75	0	49,961
status *t*1	0.05	0.23	0	1	0.64	0.48	0	1
crowd *t*	1.16	0.43	0.18	3	1.17	0.46	0.19	3
N	24,134				897			

Table 10.B3 Individuals after the economic crisis (2009), distinguishing between all youths and those who have left home

	All youths sample				*Left home*			
	Mean	*SD*	*Min*	*Max*	*Mean*	*SD*	*Min*	*Max*
pov *t*1	0.16	0.36	0	1	0.18	0.38	0	1
LHome	0.03	0.18	0	1	1.00	0.00	1	1
Frpov1	0.15	0.36	0	1	0.08	0.26	0	1
Frpov2	0.30	0.46	0	1	0.23	0.42	0	1
Frpov3	0.32	0.47	0	1	0.34	0.47	0	1
Frpov4	0.23	0.42	0	1	0.35	0.48	0	1
eqinc *t*	17,597	10,833	0	212,000	20,684	11,523	1,857	149,000
finhard *t*	0.39	0.49	0	1	0.33	0.47	0	1
aftercr	1.00	0.00	1	1	1.00	0.00	1	1
TerEd *t*	0.19	0.39	0	1	0.35	0.48	0	1
SecondEd *t*	0.49	0.50	0	1	0.38	0.49	0	1
TerEd *t*1	0.23	0.42	0	1	0.37	0.48	0	1
SecondEd *t*1	0.51	0.50	0	1	0.38	0.49	0	1
male	0.54	0.50	0	1	0.49	0.50	0	1
age *t*	24.31	4.54	18	34	27.03	3.98	18	34
agesq *t*	611.36	230.39	324	1156	746.74	212.35	324	1156
age *t*1	25.30	4.56	18	36	28.10	4.01	19	36
agesq *t*1	660.86	240.29	324	1296	805.57	222.52	361	1296
goodhealth *t*	0.92	0.28	0	1	0.93	0.25	0	1
goodhealth *t*1	0.91	0.28	0	1	0.93	0.26	0	1
Spain	0.32	0.47	0	1	0.38	0.49	0	1
Greece	0.11	0.32	0	1	0.09	0.29	0	1
Portugal	0.15	0.36	0	1	0.16	0.37	0	1
FrIncome *t*	0.19	0.21	0	1	0.33	0.21	0	1
PerIncome *t*	6,815.67	8,028.65	0	1.45E+05	12,924.43	8,634.96	0	73881
status *t*1	0.05	0.21	0	1	0.60	0.49	0	1
crowd *t*	1.18	0.44	0.13	3	1.24	0.48	0.4	3
N	26271				833			

11 Youth unemployment and health over 50

Evidence for the European countries

Orietta Dessy

Introduction

There is a widespread evidence of youth unemployment in Europe in recent decades: according to the most recent Eurostat data, over 50 per cent in Greece and Spain, over 30 per cent in Bulgaria, Italy, Portugal and Slovakia, and a European average of 22 per cent. Many explanations can be found for these stylized facts: the general situation of the labour market, education and training systems, labour market and employment policies, the stratification and distribution of opportunities in society, and certainly the global financial and economic crisis of 2007–10. One of the most worrisome features of the European young population is the large share of people who are neither in education nor in employment or training (NEET) and can remain in such a status for a long time.

As Fernandes and Gabe (2009) show, disconnection from the labour market can have detrimental effects on health. More precisely, there is a long-standing medical and psychological literature attesting to the correlation between unemployment and both physical and mental health; see, for example, Bartley (1994) and Jin *et al*. (1995) for a survey. In this chapter we focus our attention on the long-term consequences of this phenomenon. In the actual context of high youth unemployment and ageing population it is crucial to investigate the relationship between unemployment and health from a life-course perspective: if prolonged unemployment experienced when young does worsen physical or mental health in the future, these costs have to be taken into account in a proper evaluation of the social costs of the recent outstanding levels of youth unemployment. Mental diseases, in particular, have recently received attention with regard to the challenges that governments will face in the future. According to the World Health Organization (WHO), for example, mental illness is an enormous public health problem with substantial economic costs that have been estimated in developed countries to be between 3 and 4 per cent of gross national product (WHO, 2003). The Organisation for Economic Co-operation and Development (OECD) concluded in its recent review that the 'available evidence on mental illness and its connection with work is partial or incomplete, and many important elements are still unknown or not fully understood' (OECD, 2012, p. 200). In particular, the OECD drew attention to two aspects that need to be improved: the availability and analysis of data systems capable of linking health and employment outcomes; and the development of appropriate methodologies to investigate the well-known complexity of the causal connection between health and unemployment.

In this chapter we explore the first of the above issues, using the Survey of Health, Ageing and Retirement in Europe (SHARE) data set. In the European context, inter-country comparisons are particularly useful for understanding how the institutional settings might have a role in the unemployment–health relationship, but require homogeneous data not easy to access. SHARE supplies comparable and complete information about both physical and mental health. The purpose of the survey is to produce data useful for analysing the process of ageing in Europe, so since 2004 many details have been collected every 2 years from a representative sample of over-fifties about family characteristics, individual behaviour and health. Moreover, in the third wave (2008) the survey asked unique questions about all the job and relevant episodes of individuals throughout their entire lives. Therefore we can study youth unemployment from a life-cycle perspective, linking these episodes to mental and physical health when adult, for people belonging to different institutional settings and cultures in Europe.

To our knowledge this is the first time that analytic evidence about the youth unemployment–health relationship has been available at the country level. Previous studies on the same issue and source of information are Schröder (2011c, 2013), but they focus on involuntary job losses that might happen at any age between 20 and 60. In Schröder (2011c) inter-country differences are considered, but only in terms of subjective evaluations of physical health, and some explanation is given using measures of welfare state characteristics. Schröder (2013) uses SHARE as a European pooled data set highlighting gender differences, and finding that for men the negative consequences of job loss involve predominantly depressive symptoms, whereas for women a worsening of physical health is observed. Our analysis contributes by focusing on inter-country comparisons, considering unemployment episodes that took place at young age (below 30), and relating them to *objective* measures of *both* physical and mental health when over 50.

Due to the small dimension of the sample of people who experienced unemployment at young age by country, at this stage of the analysis we cannot explore the causal relationship between youth unemployment and health. As will be shown in detail in the survey section below, this would require us to consider the reasons of unemployment, and therefore to further disaggregate the samples. Despite the fact that we provide only descriptive, albeit original, evidence, we do find interesting preliminary results. Pooling all the countries together, we would conclude that youth unemployment is not correlated to physical health, only to mental health. However, analysis at the country level shows differences across countries. Whereas in Germany, Denmark, Austria, the Netherlands and Italy the negative consequences of youth unemployment concern *physical health*, in France and Spain people experiencing an unemployment episode when young have a high probability of incurring in *mental illness* when old. In Belgium we observe negative effects for both physical and mental health. Overall, women have worse health outcomes than men.

This chapter first surveys the existing literature about unemployment and health. It then describes the SHARE data and presents the results of our analysis, before presenting our conclusions.

The literature

Research into the relationship between unemployment and health has a long history in social science. As shown in Jin *et al*. (1995), the first studies on this issue were carried out on aggregate or macro-level data for the entire population of nations, states or cities. Using time series analyses, a strong correlation between unemployment rates and health status indicators, such as mortality rates, has been found in most of the countries considered. Among the causes of death, those that turn out to be more correlated to unemployment are cardiovascular diseases (Brenner, 1983, 1987a,b,c; Brenner and Mooney, 1982; Bunn, 1979; Moser *et al*., 1986) and suicide (Moser *et al*., 1987; Martikainen, 1990; Iversen *et al*., 1987; Morrell *et al*., 1993; Pritchard, 1992). The relationship between unemployment and mental health has also been investigated in depth in the literature. Starting from Jahoda *et al*. (1932), who studied the socio-psychological effects of unemployment in the Great Depression, many studies (for a review, see Bjorklund, 1985; Bartley *et al*., 2006) have contributed to the following possible explanations of the detrimental effects of unemployment on health: first of all, poverty, since low levels of a variety of wealth measures were always associated with worse health; second, stress, as unemployed individuals lose self-esteem, important networking possibilities, and a time structure to their days; and third, self-destructive behavior, from increased levels of smoking and drinking to self-destructive behavior such as (attempted) suicide.

These conclusions have been supported by analyses carried out on individual-level data, both cross-section and longitudinal (see, for example, Ruhm, 1999; Jacobson *et al*., 1993; Sullivan and von Watcher, 2009; Strully, 2009; Gallo *et al*., 2009). Individual data allow us to examine in depth the direction of the causal relationship between unemployment and health, a crucial point of debate in the literature (see (see Bjorklund, 1985; Eliason and Storrie, 2009; Smith, 1999). An inverse causality issue may emerge. Indeed, if it is accepted that unemployment might be a cause of deterioration of health, it is also true that people in bad health might have an higher probability of being unemployed.

Whenever possible, therefore, the analyses carried out on individual data have focused on involuntary job losses. With cross-sectional data the health consequences of job loss have been studied by comparing the health outcomes of a sample of unemployed people with those of a control group of employed people or with those of the general population. With individual-level longitudinal studies the issue of endogeneity has mainly been solved in the literature by using cohort or case–control designs. A common cohort study design was the factory closure or plant closure study, in which the health outcomes of workers laid off as a result of factory closure were measured prospectively and compared with those of workers at a workplace that was still in operation. According to this approach plant closures are a category of job loss which is (arguably) exogenous to individual characteristics. When a large business is closed, the individual's performance does not matter enough to have caused the closure. The following 'displacement' is then interpreted to be causal for changes in the outcome variable of interest. This approach still has drawbacks: firms can be too small, or more productive individuals could desert the 'sinking ship' before the plant is actually shut down. However, for investigating the consequences of job loss it is clearly superior to using all individuals who lost their jobs without differentiating the reasons.

Although the majority of studies that control for the endogeneity issue find a negative impact of unemployment on health, some studies, also using plant closures to identify exogenous job loss, do not find any significant effects of job loss on health. Browning *et al*. (2006) use a 10 per cent random sample of the Danish male population to investigate how job loss is associated with medical stress indicators. They find that displacement does not lead to hospitalization for stress-related illnesses. In comparison to the United States, they speculate that the generous welfare scheme in Denmark may have offset any negative effects of displacement on health. However, a different study using administrative data from Sweden reports a higher mortality of those who are displaced (Gerdtham and Johannesson, 2003) and thus finds significant effects for a country more similar to Denmark than to the USA. Salm (2009) considers several subjective and objective health measures in his study of individuals in the Health and Retirement Survey (HRS). Using a difference-in-differences approach, he does not find any significant effects of plant closure (or of being laid off) on health. But he considers only a two-year time period between unemployment and the reported health status, so he might underestimate those effects appearing only later.

Due to lack of suitable data, long-term effects of involuntary job loss on health have been investigated only very little. Sullivan and von Watcher (2009) were able to look at mortality rates 20 years after job loss, showing that they are still 10–15 per cent higher compared to those without job loss. Using SHARELIFE data, Schröder (2011c) found negative effects of job loss occurring between 20 and 60 on long-term health. He found that the differences in the country-specific welfare state approaches reduce these negative effects in the population. On the same data Schröder (2013) explicitly investigates the long-term effects of involuntary job loss on health for men and women considered separately. He uses a wide range of health measures, finding that the (negative) effects are different for men and women: compared to those who never lose their job, men with an earlier involuntary job loss are significantly more likely to show depressive symptoms, whereas women experience negative health consequences predominantly in their physical health.

The link from economic instability to stress and health can be legitimated by theories based on biological processes (Sterling and Eyer, 1988; McEwen and Stellar, 1993). These postulate that experiencing frequent or prolonged episodes of stress can lead to wear and tear on the body, disrupting regulatory systems and ultimately worsening health. These theories emphasize *allostatic load* or *physiological dysregulation* as the mechanisms by which stressful events lead to worse health outcomes in the long term. Studies that provide evidence of the mediating role of physiological dysregulation (measured usually by a count of biomarkers beyond levels of clinical risk) between stresses associated with low socio-economic status, poor work conditions (including job demands), and future mortality are Seeman and Burton (1997), Schnorpfeil *et al*. (2003), Seeman and Crimmins (2004) and Seeman and Merkin (2008). Kuh and Ben-Shlomo (2004) postulate that later-life health and responses to shocks are a result of the accumulation of exposure to risk factors throughout life. Individual heterogeneity in the responses to these events is shaped by, among other factors, experiences early in life. Along these lines, the impact of major life events may differ across individuals because of the conditions that individuals have been exposed to early in life. This is the approach of the so-called life-course literature.

Along these lines we find the recent contribution of Michaud *et al*. (2014) on US data. They use the longitudinal HRS with biomarker and anthropometric measures collected in 2006 and 2008 for over-fifties to investigate the relationship between exposure to job loss (distinguishing between layoffs and business closures, on an exposure period from 2 to 14 years) and objective measures of health. They can investigate the potential for reverse causality to bias inference, because they have data on an extensive set of health measures prior to job loss, as well as job loss expectations for a subset of waves. The use of a matching estimator allows them to match those who experience and those who do not experience job loss on a large set of characteristics, including self-reported health measures. They find strong evidence that layoffs lead to diminished health as measured from biomarkers.

The data

The data used in this chapter are taken from SHARE, which is a data collection effort in answer to a call by the European Union to describe the ageing process of the population aged 50 and over. In 2004, data were first collected in 11 countries of northern, central and southern Europe[1] (for a detailed description, see Börsch-Supan and Jürges, 2005). The target population of individuals is defined as 'all individuals born in 1954 or earlier, speaking the official language of the country and not living abroad or in an institution such as a prison during the duration of the field work, and their spouses/partners independent of age'. A longitudinal panel was then constructed following the same individuals in 2006, 2008, 2010 and 2012. In 2006 two former communist countries (the Czech Republic and Poland) and Ireland were added. In 2010, Estonia, Hungary, Portugal and Slovenia joined SHARE wave 4.

The 2008–9 round of the SHARE survey was designed as a completely retrospective survey to collect the respondents' life histories, hence the project name 'SHARELIFE'. This third wave contains retrospective information on the entire life histories of about 75 per cent of the individuals who participated in waves 1 or 2. To reach optimal data quality, data were collected using a 'Life History

Calendar' Blane (1996); Belli (1998), which was programmed in the CAPI questionnaire – for programming details, see Das *et al*. (2011); for concepts and topics, see Schröder (2011a)). Due to their retrospective nature, the data are well suited to relate events in a person's life course to long-term outcomes (Börsch-Supan and Schröder, 2011). The information collected covers the family evolution, childhood living conditions, an assessment of major illnesses in life, and general life events. An employment history module gathers details of every major job, such as start and end date, the type of job, its industry and on what terms it ended.[2] In our analysis we use the very useful reshaping of the work history section of SHARELIFE provided in the retrospective SHARE Job Episodes Panel Data (Brugiavini *et al*., 2013). Here all the information supplied at individual level is arranged in a panel where each respondent contributes as many observations as there are years of age from birth to the age at which he is observed at the time of the SHARELIFE interview. We use this retrospective panel because it contains cleaned information on the start and end dates of all job spells the respondents had during their working life, so that unemployment episodes experienced in young age can be easily and correctly pointed out. Restricting the maximum age for the definition of 'young unemployment episodes' to 30 years, we end up with a sample of 1,197 individuals who have had at least one unemployment spell when under 30.

We then combine this information with that provided in the first, 2004 wave of SHARE about physical and mental health. After the merging, we keep only those individuals participating in both the 2004 wave and the 2008 SHARELIFE panel, ending up with an analytical sample of overall 15,993 individuals, of whom 4.43 per cent (709 individuals) were unemployed at least once when young. Table 11.1 illustrates the distribution of this sample across the 11 countries participating in the first wave of SHARE. We can see that the number of observations for each country is acceptable for estimating the relationship between youth unemployment and elderly health. However, further splitting the sample by gender or by any other job or unemployment characteristics (e.g., the reason for the job coming to an end) would be not advisable for performing an analysis at the country level. Wishing to emphasize, at this stage of our investigation, inter-country differences, we prefer to undertake a quite general and descriptive analysis without going into the details of the reverse causality problems.

Also for the choice of the indicators of physical and mental health, despite the richness of information available in SHARE, we choose at this stage the most widespread indexes constructed according to harmonized inter-country criteria: body mass index (BMI), number of limitations with activities of daily living (ADL) and number of limitations with instrumental activities of daily living (IADL) for physical health; and the EURO-D depression scale for mental health. The BMI variable is based on information available about weight and height (BMI is defined as weight in kilograms divided by height in metres squared) and is a continuous variable. BMI2 reclassifies BMI into the standard categories of body mass index determined by the WHO (1 = underweight, BMI

Table 11.1 Distribution of the sample across the European countries

	Austria	*Germany*	*Sweden*	*Netherlands*	*Spain*	*Italy*
No youth unemployment						
No. of observations	715	1,229	1,596	1,517	1,246	1,381
%	96.75	98.87	98.82	97.12	96.89	88.02
Youth unemployment						
No. of observations	24	14	19	45	40	188
%	3.25	1.13	1.18	2.88	3.11	11.98
Total no. of obs.	739	1,243	1,615	1,562	1,286	1,569
	France	*Denmark*	*Greece*	*Switzerland*	*Belgium*	*Total*
No youth unemployment						
No. of observations	1,687	1,014	1,920	591	2,388	15,284
%	97.35	97.13	91.65	98.5	95.25	95.57
Youth unemployment						
No. of observations	46	30	175	9	119	709
%	2.65	2.87	8.35	1.5	4.75	4.43
Total no. of observations	1,733	1,044	2,095	600	2,507	15,993

Source: SHARE 2004 merged with SHARELIFE 2008.

below 18.5; 2 = normal, BMI between 18.5 and 24.9; 3 = overweight, BMI between 25 and 29.9; 4 = obese, BMI 30 or higher). ADL comes from data on 14 items about limitations on very general activities of daily living that include dressing (also putting on shoes and socks), walking across a room, bathing or showering, eating (such as cutting up food), getting in and out of bed, and using the toilet (including getting up or down). IADL is based on 14 items describing limitations with *instrumental* activities of daily living reported by each individual. The activities include: using a map to figure out how to get around in a strange place, preparing a hot meal, shopping for groceries, making telephone calls, taking medications, doing work around the house or garden, and managing money (such as paying bills and keeping track of expenses). The EURO-D depression scale is an index, increasing in the level of depression, generated from 12 variables that consider the following aspects: depression, pessimism, suicidality, guilt, sleep, interest, irritability, appetite, fatigue, concentration, enjoyment, and tearfulness. The variable EURO-D CAT reclassifies EURO-D so that 0 identifies the absence of any of the 12 items above and 1 the presence of at least one item.

Although reflecting an objective state of health, the measures that we use are self-reported and therefore may suffer from measurement error – see Jürges (2007) for response style differences; Means *et al*. (1989) for recall bias in reporting doctoral visits; and Danubio *et al*. (2008) for the consequences on obesity measures of misreporting height and weight.

Results

The dependent variables of the models that we estimate are the indexes of physical and mental health described in the previous section. The only continuous variable is BMI; the others are categorical variables that express an increasing level of illness in qualitatively different aspects. For this reason we use an OLS regression for BMI, but we choose to estimate an ordered probit model for BMI2, ADL, IADL, EURO-D and EURO-D CAT. Here we define a worsening of physical health for over-fifties as an increase in any of the physical health measures. In fact an increase in BMI when old is always correlated with a number of serious diseases, and a deterioration in health status increases the number of limitations in daily activities. Similarly, a worsening of mental illness is measured by an increase in the range of depression symptoms. The variable that identifies an episode of youth unemployment (YUNEMPL) is a dummy, and as control variables we use the two main features considered in the literature on the relationship between unemployment and health: age and gender.

Table 11.2 shows the results of our regressions when the data are pooled. For the ordered probit we report the estimated coefficients and not the marginal effects, therefore we discuss only their sign. Clearly, YUNEMPL is significant and positive only for the indexes of mental illness; it is never significant for measures of physical health. This result is in line with what found in the previous literature discussed earlier.

When we interact YUNEMPL with the country dummies we obtain the results shown in Table 11.3. Interestingly, we find that an episode of youth unemployment is correlated with adverse physical health in some countries and with mental health problems in other countries. Youth unemployment increases BMI and ADL of old people in Germany, IADL in Denmark, and has a weakly significant positive relationship with BMI in Austria, ADL in Belgium, and IADL in the Netherlands and Italy. The countries where youth unemployment is more correlated with a deterioration of mental health when over 50 are (in order of significance of coefficients) only France, Belgium and Spain.

In agreement with previous findings in the literature, there is a strongly significant age and gender effect in the SHARE data. BMI decreases with age, especially when over 50, and all the indexes of physical and mental health increase therefore revealing an overall worsening of health. Women have a lower BMI than men, but overall a worse physical and mental health.

The fact that our indexes of physical health are significant in the majority of the countries considered is striking and worrisome at the same time. We highlight that the consideration of different kinds of limitations to daily activities among the determinants of physical health status is an original aspect of our analysis. As pointed out above, previous studies have focused their attention on specific (mainly cardiovascular) diseases, therefore producing forecasts about the costs of particular medical expenditures correlated with episodes of young unemployment. Since the causes of physical limitations can be diverse we are not able to give such detailed predictions. However, our results draw attention to the need

Table 11.2 Analysis pooled for the European countries

	BMI	*BMI2*	*ADL*	*IADL*	*EURO-D*	*EURO-D CAT*
Age	–0.012***	–0.001	0.032***	0.040***	0.009***	0.008***
YUNEMPL[1]	0.186	0.033	0.037	0.044	0.104**	0.165***
gender	–0.590***	–0.181***	0.184***	0.415***	0.507***	0.582***
No. of observations	15,179	15,179	15,383	15,383	15,162	15,162
R^2	0.006					
Pseudo R^2		0.003	0.045	0.071	0.016	0.041

Source: SHARE 2004 merged with SHARELIFE 2008.

[1] YUNEMPL = dummy for an unemployment spell when under 30.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 11.3 Cross-country analysis

	BMI	*BMI2*	*ADL*	*IADL*	*EURO-D*	*EURO-D CAT*
Age	–0.012***	–0.001	0.033***	0.040***	0.009***	0.008***
Gender	–0.592***	–0.181***	0.181***	0.411***	0.505***	0.582***
yu[1]*Austria	1.694*	0.229	–4.193	–0.204	–0.127	0.085
yu*Germany	3.418***	0.778**	0.947***	0.275	0.085	–0.327
yu*Sweden	0.618	0.030	0.353	0.035	–0.379	–0.244
yu*Netherlands	–0.095	–0.131	–0.091	0.377*	0.018	0.030
yu*Spain	0.562	0.191	0.029	0.377	0.276*	0.068
yu*Italy	0.285	0.095	–0.119	–0.259	0.024	0.144
yu*France	–0.411	–0.143	0.157	–0.119	0.547***	0.722***
yu*Denmark	–0.467	–0.092	0.144	0.539	0.164	0.403
yu*Greece	–0.059	–0.022	–0.084	–0.075	0.017	0.134
yu*Switzerland	–0.534	–0.135	–4.129	–0.235	0.076	–0.078
yu*Belgium	0.059	0.005	0.299*	0.225	0.305***	0.205
No. of observations	15,179	15,179	15,378	15,378	15,162	15,162
R^2	0.006					
Pseudo R^2		0.004	0.047	0.072	0.017	0.042

Source: SHARE 2004 merged with SHARELIFE 2008.

[1] yu = dummy for an unemployment spell when under 30.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

for personal home care that young unemployment might generate in old age to help with physical limitations. In most countries these expenses are not covered by public institutions and are a burden on the personal budgets of families. The results of our analysis are therefore useful for drawing attention to how to support future possible needs for family care assistance.

Conclusion

This chapter began by reviewing the literature about the relationship between unemployment and health. There is strong evidence in all the countries considered for a significant correlation between unemployment and measures of both physical and mental health. Few studies, however, analyse the long-term relationship using individual data, especially across countries, and the number of limitations to daily activities (ADL, IADL) as an index of physical health.

We give preliminary stylized facts for European countries, comparable thanks to the availability of the recent SHARE data set. These data aim to describe the ageing process in Europe, and since 2004 have followed a representative sample of over-fifties. In 2008 more information about major events over the life cycle (concerning health, family composition and job history) was collected, allowing us to link episodes that occurred when young to health when over 50 using the so-called SHARELIFE panel.

In particular, we focus on unemployment spells occurring before age 30 and on their relationship to measures of both physical (ADL, IADL, BMI) and mental (EURO-D) health after age 50. We find that, although when European countries are pooled youth unemployment is correlated only with mental health, the analysis at country level shows that youth unemployment can lead to physical and mental illness, varying from country to country. Youth unemployment decreases measures of physical health in Germany, Denmark, Austria, Belgium, the Netherlands and Italy, while leading to a deterioration of mental health among over-fifties in France, Belgium and Spain.

Although further research is needed, especially to adjust the above results for the well-known problem of reverse causality, our findings are quite interesting. Recently strong attention has been paid by policy-makers to the negative consequences of unemployment for mental health and to the enormous economic costs involved. But in light of the recent growth in youth unemployment in many countries the possibility of increased future expenditure on physical illness cannot be neglected, in particular to fund the personal assistance needed for daily activities.

Notes

1 The European countries included in wave 1 are Austria, Belgium, Switzerland, Germany, Denmark, Spain, France, Greece, Italy, the Netherlands, and Sweden. In 2005 Israel also joined the project.
2 For details on the questionnaire, see Schröder (2011b).

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12 Intergenerational equity and intergenerational mobility in Italy

An analysis from SHIW

Federica Roccisano

Introduction

Equity between generations is considered a central problem in many developed countries because of the weaknesses of the modern welfare state and because the last economic crisis has worsened the economic condition of the population and particularly of young people. The principle of intergenerational equity is much more common in the environmental sector, but we have to consider the idea of equity between generations from a social and economic point of view.

The aim of this chapter is to suggest that the idea of intergenerational equity should be placed at the heart of future reforms in order to obtain the same opportunities between present and future generations and between elderly and young people. In particular, the work aims to analyse the situation of young people in the first decade of the 2000s, investigating intergenerational equity and hence equity among different contemporary generations (young and old, father and son), as well intragenerational equity to show how the situation for the same generation is changing.

We will consider first of all the distribution of income to measure the elasticity of intergenerational mobility's. Later, we will consider two aspects in greater detail: first the level of intergenerational equity between generations during our period of analysis, and then we will study how it could be matched with intergenerational mobility, measured as the degree of upgrade or downgrade of son's income compared with their parents' income.

In recent years, the relevant literature on intergenerational mobility has been growing rapidly. Many studies are currently available that examine the relation between intergenerational equity and intergenerational mobility. The OECD (2010) noted that a lower degree of equality of the earnings distribution can reduce the incentive for parents to invest more in their children, producing higher levels of intergenerational mobility. If we consider education, it is easier for privileged parents to invest money for their children's educational advantage, while underprivileged parents cannot afford this. In the absence of public intervention this can produce the so-called immobile society where an individual's wage, education or occupation is strongly related to those of his/her parents. Otherwise, targeted public policies can mitigate these effects: public spending on education, policy in favour of job protection or the presence of a minimum wage, influence positive parental investment and thus the level of intergenerational mobility (Smeeding *et al*. 2011).

In northern Europe (e.g. Norway or Sweden) we find evidence of policy interventions that combined low unemployment with extensive job security and wage equality, leading to very good results in intergenerational mobility. From this evidence researchers such as Bratberg *et al*. (2005) discovered that a stable earnings distribution can strengthen stability in intergenerational mobility. But the most innovative contribution comes from the USA: in 2012, the debate on intergenerational mobility experienced a dramatic development, and this kind of problem is now considered a crucial point for progressive economists. The result is the creation, by Alan Krueger and with the help of Miles Corak, of what is called the 'Great Gatsby curve'.[1]

The Great Gatsby curve (Figure 12.1) is inspired by *The Great Gatsby*, Fitzgerald's well-known story about Jay Gatsby – the cynical idealist, who embodies America in all its messy glory – and the American dream at the time of the crisis of 1929. It represents the existing relation between inequality of incomes, measured by the Gini coefficient of household earnings of the population aged 18–65, and a measure of intergenerational mobility (Corak 2013). The fundamental idea of this instrument is to evidence how countries with a high rate of income inequality present a high level of transmission of economic status from parents to children.

According to this curve, countries like Italy, the UK and USA show a rigid economic structure, with rich children predestined to grow up wealthy, and poor children more likely to remain impoverished in adulthood, while northern countries evidence less influence between sons' and parents' economic conditions.

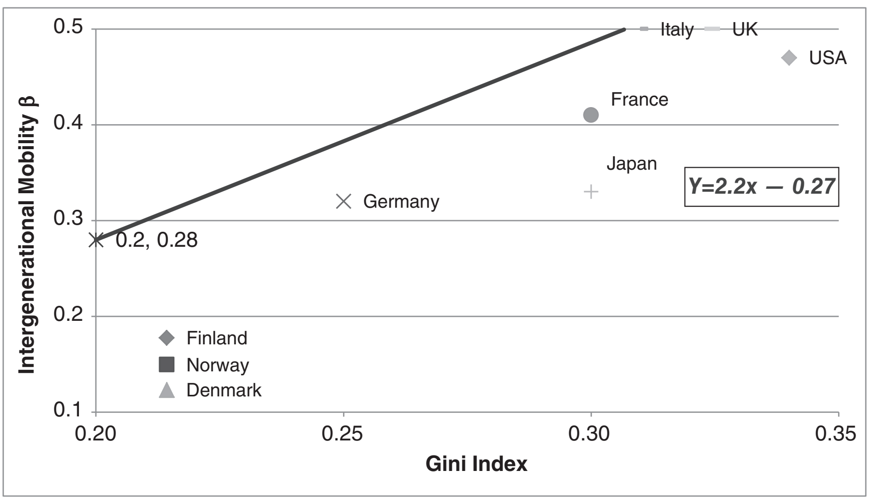

Figure 12.1 Corak's Great Gatsby curve

Note: The value of β indicates the elasticity between paternal earnings and son's adult earnings.
Source: Corak's data.

Finally, this instrument is useful from another viewpoint: while intergenerational mobility elasticity shows the average measure of the degree of mobility, but does not give information about the direction of change, with the Great Gatsby curve we may highlight differences in the degree of upward cross-country or cross-year mobility in the same country.

In this paper we offer an examination of the evolution of intergenerational mobility and intergenerational equity in Italy. We will use data from the Survey of Household Income and Wealth (SHIW) for both analyses. We start from the results of recent study on the Italian case, and particularly from the study carried out by Piraino (2006). For the investigation of intergenerational mobility, we use the same method of the Italian researchers, but we try to analyse the causes of the increasing intergenerational mobility in recent years, directing our attention to several factors: geographical areas, job title and job sector.

For this purpose, in the final part of the chapter, we will consider the Gini index to observe the income distribution, and the trend of market labour by the analysis of job sector and job title between generations. Then we highlight how the economic prospects for young people in Italy are worsened.

Analysis of the problem

Inequality and social conflict

The trend of intergenerational mobility in most developed countries has changed following the evolution of society during the first half of the twentieth century: before the two world wars grandparents of those born in the 1940s shared many of the same experiences with their children; while for those who were born in the 1960s, changes in work, employment and politics have produced a lot of benefits (Higgs and Gilleard 2010). The worst situation affects people born in 1980s and 1990s when workers began to leave their jobs in increasing numbers and at earlier ages: poverty rates among older people declined while younger households and opportunities rose (Costa 1998). Thus many researchers talk about an intergenerational crisis or intergenerational conflict to underline how the actual situation is producing very poor future prospects for younger generations (Emery 2012).

The economic crisis of the 2000s also produced a reduction in employment for young people, especially males. Ireland and Spain fared worst of the EU countries, with a fall of the employment rate of respectively 24 per cent and 20 per cent between 2007 and 2010 (Jenkins *et al*. 2013). If we consider the Italian situation, the economic crisis has produced the biggest fall in employment rates: from 59.1 per cent in 2007 to 57.5 per cent in 2009 and 57.3 per cent in 2010. In Italy the worst situation is that of young people (15–39), in terms of both employment rates (–4.1 per cent) and the drop in income (–6.6 per cent) (Brandolini *et al*. 2013).

If young people live in a disadvantaged condition, with low incomes, there will be long-term consequences: we will have poor families who in turn will produce poor children, and then poor adults. This vicious circle is sometimes called the intergenerational transmission of inequality: living conditions, endowments and investments in education by parents are unable to better the socioeconomic status of children (Collard 1999).

Unfortunately, this transmission is not just due to individual motivations or personal propensity to altruism, but is also subject to the current economic situation, to the welfare system and to the economic structure of the country. In fact, in a rigid society, with unequal opportunities, parents have a major role in safeguarding their children's careers, while schools may reinforce parents' actions: richer parents can pay for admissions to elite colleges, granting huge opportunities to their children. Conversely, in a more equal society, the process has an inverse direction: the institutions create policies boosting the skills and behaviours of low socioeconomic status children in ways that fully offset the family's skills and behaviours (Duncan *et al*. 2012). Nolan (2012) has recently analysed this mechanism. Particularly with reference to Italy and the southern European countries the crucial role of family makes the society almost 'immobile' and hence children born in a poor family are bound to be poor adults.

Determinants and methodology

Intergenerational mobility has been studied by several researchers (economists, sociologists, psychologists) and with several methodologies. In this chapter we will use the equation created by Solon (1992) and Zimmerman (1992). This equation measures the intergenerational mobility from the relationship between the socioeconomic status and income of parents and the status and income of their child:

$$y^s = \alpha + y^d\beta + \varepsilon . \qquad (12.1)$$

Here y^s is the vector (in log terms) of fathers' permanent incomes, and y^d the vector of sons' permanent incomes. The coefficient β denotes the rate of intergenerational elasticity, used as a measure of intergenerational mobility. Its value varies between 0 and 1: if β is close to 1 we will have a very strong impact of parental outcomes on children's economic status: a high level of intergenerational inequality and less intergenerational mobility. If β is near 0 there is no relation between the child's position and her/his parent's position and we are in a very mobile society (Blanden *et al*. 2005).

Concerning the creation of the dataset for this equation, Solon suggests creating two different samples: one for fathers and one for sons. The decision of the age of the individual could generate several measurement errors: the best way to overcome this kind of problem is to consider a mean age of 40 (Hairer and Solon 2006).

Another choice concerns how to measure the status of fathers and sons: by income, education, occupation or social class. Frequently economic research has focused on two measures: disposable income and labour income. In investigating labour income intergenerational mobility we can look at the market labour system, its accessibility and returns to education in the labour market (D'Addio 2007). Observing the elasticity of disposable income is most indicative of paternal influence on the standard of living of sons because it considers the different sources of income (e.g. earnings, assets, welfare) (Lee and Solon 2006).

Both income and wage relations across generations produce an effect of family background on cognitive skills acquired by sons during their education. Recent studies confirm that there is a direct connection between intergenerational wage mobility and intergenerational educational mobility (Blanden 2013).

Most empirical studies using Solon's equation are based on measuring the labour income relation across generations; while to measure educational persistence they use the correlation between years of schooling or educational achievement of fathers and their sons (Causa and Johansson 2010).

Finally, there is another factor that can influence the intergenerational mobility. Recently Hellerstein and Morrill's (2011) have examined the level of intergenerational transmission among employees: in recent cohorts, about 30 per cent of sons and 20 per cent of daughters have the same work as their fathers, and this is further evidence of the global immobile society in which we are living. Many other studies examining intergenerational mobility in occupation find the same conclusion and highlight the strong relationship between occupations of fathers and sons (Carmichael 2000; Di Pietro and Urwin 2003).

Starting from these determinants in the next pages we analyse the rate of intergenerational mobility in Italy.

A review of intergenerational mobility in Italy

Most of the studies on intergenerational mobility study the situation of North America or northern Europe use datasets with complete information (wage, income, education) for both fathers and sons like the US Panel Study of Income Dynamics or Swedish Level of Living Surveys (Bjorkland *et al*. 2007). Italy does not have a complete panel with all the information for at least two generations. Because of this, Italian researchers have had to use a different method. The first Italian research was done by Barbagli *et al*. (1986): they tried to analyse intergenerational mobility in Italy by considering occupational status: they used a data set built on an *ad hoc* basis in 1985 by a group of sociologists from different Italian universities about the working conditions of 5,160 individuals from 18 to 65 years old. The conclusion of this first analysis was a description of Italy as an immobile country where the highest percentage of sons are destined to have the same economic and social status as their fathers.

If this first study mainly considers occupational status, the study done by Checchi and Dardanoni (2003) also considers disposable income and educational attainments. To do their analysis they used the SHIW, particularly the surveys conducted in 1993, 1995 and 1998. For each member of the family they gathered information about educational attainment, work status and sector of employment, as well as educational qualifications, employment status and sector of activity of parents. Two observations are in order. Firstly, concerning the research target, these researchers had decided to disregard the age of sons, as is common in this kind of research; they just considered in the sample of sons all individuals who were employed and earned a positive income. With regard to the methodology, we remark that Checchi and Dardanoni did not aim to calculate the elasticity of income between fathers and sons, but to present an ordinal measure of social position between generations, and a representation of the evolution of occupational income and educational mobility. The trend presented showed a strong decrease in mobility from the baby-boomer generations to their sons, as an evidence of the structural change in economic structure due to the decline of industrialization in Italy.

The most recent studies on Italy are those by Piraino (2006) and Mocetti (2011); these will be an important starting point for our work. They demonstrate how to measure intergenerational mobility without complete datasets like the PSID. They worked with the SHIW data, like Checchi and Dardanoni did, but they also calculated the intergenerational mobility and the value of β. To overcome the lack of complete data across generations, they used a *two-sample two-stage least squares* (TS2SLS) estimator.[2] In line with this approach, they created two different samples: one with fathers' information and one with sons' information.

To explain the methodology we consider the work of Piraino (2006). For the first stage he creates a sample with SHIW data from 1977 to 1980 with males aged between 30 and 50; then he regresses the fathers' earnings on education level, sector of activity, job qualifications and geographical area. Before proceeding with the second stage, he creates the second sample including males between 30 and 50 from SHIW data for 2000, 2002 and 2004. Then, in the second stage he uses the coefficient estimated to predict fathers' information. As we can see in the following paragraphs, this research shows a high level of β.

In the following section we replicate the same methodology but we also try to take a further step by investigating the evolution and the macroeconomic causes of the low level of mobility and worsening of conditions for youth in Italy.

Case study: the Italian condition

The model: intergenerational mobility in Italy 2012

In this section, we will analyse the trend of intergenerational mobility in Italy. To have a measure of the intergenerational mobility we will apply Solon's equation (121.1). We know that Italy does not have a complete panel with all the information for at least two generations. We use the SHIW and, since this survey is too short to obtain consistent results, we follow the methodology of Piraino (2006) and create two different samples and proceed using the TS2SLS estimator.

To implement the TS2SLS procedure we continue with two samples, one for fathers (from the 1989 and 1991 database) and one for sons (from the 2010 and 2012 database). For the sample of fathers, we consider all males between the ages of 35 and 47 years, so as to have the average age of 41 as suggested by Solon and Zimmerman. Our variables will be year of education, job sector, job title, age, labour income, disposable income. We run the following regression:

$$y_t^d = 1\delta + A_t^d\gamma + \upsilon^d + k_t^d \tag{12.2}$$

where $I\delta$ indicates the time-invariant determinants (year of education, labour income, disposable income, work sector, work qualification), and $A_t^d\gamma$ the time variable (age). The last two factors, $\upsilon^d + k_t^d$, are the time-invariant and usual disturbance. It is important to underline two aspects of our research. Firstly, in this paper we do not consider gender information because in our model we do not consider the income of the breadwinner, just the income of fathers and sons. Secondly, with the aim of investigating the role of the market and of the government in the rate of intergenerational mobility, we have decided to consider the elasticity of labour income between father and son following the traditional method, but also to analyse the elasticity of disposable income between father and son, because, looking at the disposable income, we can consider not only the income from work but also inherited and other forms of financial wealth.

Finally, it is important to underline that, considering the difficulty of working on a complete panel with a perfect match between fathers and sons, we have created a sample with the so-called 'pseudo-fathers'.

As can be seen in Table 12.1 with regard to the aims of this research, we have decided to consider only the individuals with positive wage and positive disposable

Table 12.1 Descriptive statistics for selected fathers

Variable	*Obs.*	*Mean*	*Std. dev.*	*Min.*	*Max.*
Sample size	2,755				
Age (Ag)	2,755	41.26		35	47
Education (Ed)	2,755	10.66134	4.555118	1	22
Job Title (Jt)	2,755			1	8
Job Sector (Js)	2,755			1	4
Area (Ar)	2,755			1	3
Labour income (Yl)	2,755	2,2740.16	8,701.156	2,500	87,000
Disposable income (Yd)	2,755	2,8342.52	13,368.5	3,008.092	139,231.7

Notes: Year of Education: 1 = no school, 5 = elementary school, 8 = lower secondary school, 13 = high school, 18 = university degree, 22 = specialization. Job Title: 1 = factory worker, 2 = employee, 3 = teacher, 4 = official, 5 = executive, 6 = freelancer, 7 = entrepreneur, 8 = self-employed, 9 = unoccupied. Job Sector: 1 = agriculture, 2 = industry, 3 = public administration, 4 = commerce, handcrafts, services

Source: author's calculations from SHIW 1989–91

Table 12.2 First-stage regression of fathers' wage on four variables

Variables	*Coefficient*	*Robust std. err.*	*N = 2,724* *R^2= 0.2777* *t*
Education (Ed)	0.0217	0.0015	14.26
Job Title (Jt)	0.0496	0.0071	6.91
Job Sector (Js)	0.0781	0.0068	11.39
Area (Ar)	–0.0387	0.0041	–9.37
_cons	9.1297	0.0706	129.22

Source: author's calculations from SHIW 1989–91 income. We regress the logarithmic value of labour income (wage) and the logarithmic value of disposable income:

$$\ln(Yl^d) = \beta_0 + \beta_1 Ed + \beta_2 JT + \beta_3 Js + \beta_4 Ar + \varepsilon, \tag{12.3}$$

$$\ln(Yd^d) = \beta_0 + \beta_1 Ed + \beta_2 JT + \beta_3 Js + \beta_4 Ar + \varepsilon. \tag{12.4}$$

From these two regressions we can study the influence of our factors in both labour and disposable income. Looking at the summary tables (Tables 12.2 and 12.3), we cannot point out significant differences in the influence of our factors on labour or disposable income. However, it is important for this research to underline the impact of job title and job sector on both labour and disposable income.

We can now proceed with the second stage of our model using the second sample including the information on sons: males from 35 to 47 years old from the SHIW database of 2012 (Table 12.4). This sample uses the same variables as

Table 12.3 First-stage regression of fathers' disposable income on four variables

Variables	*Coefficient*	*Robust std. err.*	*N = 2,724* *R^2 = 0.2845* *t*
Education (Ed)	0.0271	0.0017	15.59
Job Title (Jt)	0.0366	0.0083	4.42
Job Sector (Js)	0.1018	0.0079	12.76
_cons	9.698	0.0293	330.62

Source: author's calculations from SHIW 1989–91

Table 12.4 Descriptive statistics for selected sons

Variable	*Obs.*	*Mean*	*Std. Dev.*	*Min.*	*Max.*
Sample size	581				
Age (Ag)	581	39.6747	3.227446	35	47
Area	581	2.759036	1.25001	1	3
EducSon	581	11.41308	3.762533	1	22
JobtitleSon	581	3.170396	2.862399	1	9
JobsectSon	581	2.934596	.9874337	1	5
EducDad	581	7.521515	3.968623	1	22
JobtitleDad	581	2.893287	2.742823	1	9
JobsectDad	577	2.844021	1.148642	1	5
Ydson	581	21140.83	10655.48	112.945	104482
Ylson	581	13851.17	10272.95	0	68600
logYdson	581	9.813799	.6245666	4.726902	11.55677
logYlson	440	9.701277	.5775093	5.010635	11.13605

Source: author's calculations from SHIW 2010–12 the first sample with information on sons: age, area, job title, job sector, labour income, disposable income. Our equation is

$$y_t^s = \alpha + (\widehat{IYl}^d)\,\beta + A_t^s + \omega_t \tag{12.5}$$

where $\widehat{IYl}$ is the result of the first sample that allows us to replace in the second sample missing fathers' incomes with their best linear predictions.

Before proceeding with our regression we need to link the values of the son with those of their pseudo-fathers (Table 12.5). To do this we consider the information given by sons concerning their real fathers at the time of completing the questionnaire: year of birth, year of education, job title, job sector. Based on this information we create a smaller sample in which we match this real information with our pseudo-information and with our predicted values on wages and disposable income.

We can now proceed with the TS2SLS estimation, taking as our instrumental variables the information on pseudo-fathers, related to information on sons. So we can carry out the regression for labour and for disposable income:

$$1\mathrm{n}(Yl^s) = \beta_0 + \beta_1 \ln(yl^d) + \beta_2 Ag^s + \beta_3 Ar^s + \varepsilon\,. \tag{12.6}$$

If we consider the elasticity between labour income (wage) of fathers and sons, the resulting value of β in equation (12.6) is 0.63, while if we consider disposable income the value of β becomes 0.68. To understand the reasons for this difference, in the following pages we analyse the weight of all the instrumental variables.

Table 12.5 Descriptive statistics for sons and pseudo-fathers

Variable	*Obs.*	*Mean*	*Std. dev.*	*Min.*	*Max.*
Sample size	563				
Ageson	563	39.65542	3.22003	35	47
Area	563	2.73357	1.2542	1	3
Educson	563	11.42274	3.766161	1	22
JobtitleSon	563	3.14032	2.841581	1	9
JobsectSon	563	2.928952	.9849021	1	5
EducDad	563	7.559503	3.993045	1	22
JobtitleDad	563	2.722913	2.611491	1	9
JobsectDad	563	2.825933	1.149765	1	5
LogYlson	428	9.707519	.5731185	5.010635	11.13605
LogYdson	563	9.81291	.6305887	4.726902	11.55677
LogYlDadhat	563	9.968175	.1922995	9.50416	10.4536
LogYdDadhat	563	10.15983	.2333743	9.625576	10.73174
LogYlSonhat	563	9.529418	.4163829	8.162046	10.26105
LogYdSonhat	563	9.81291	.2508107	8.989794	10.43169

Source: author's calculations from SHIW 1989–91 and 2010–12

Differences between labour income elasticity and income elasticity: the weight of the Italian economic structure on intergenerational mobility

In this part of the chapter we look in detail at the differences within intergenerational mobility with respect to elasticity of labour income and disposable income.

In Table 12.6 we report our TS2SLS estimates for fathers' and son's labour income. Looking at this table, it is possible to highlight how the influence of fathers' background changes if we consider different levels of sons' education, with a stronger influence for people having only a diploma (0.60), and very low level of influence for sons with a university degree (0.08). These data, and most of all the low level of intergenerational mobility for sons with high level of education, show how education is a crucial factor in changing economic status. Concerning job titles, it is important to remark on how the higher rate of β is for

Table 12.6 TS2SLS estimation: elasticity of labour income and income between fathers and sons

Instrumental variables	*Instruments*	*Son's condition*		*β (labour income)*	*β (disposable income)*
Labour income of father	*ageson educdad jobtitledad jobsectdad educson jobtitleson jobsectson*			**0.63**	**0.68**
	ageson area educdad educson jobtitledad jobtitleson jobsectdad jobsectson	Education	Elementary education	**0.11**	**0.04**
			High school	**0.60**	**0.15**
			University degree	**0.08**	**0.03**
	Ageson educdad jobtitledad jobsectdad	Job Title	Factory worker	**0.33**	**0.28**
			Employee	**0.29**	**0.19**
			Teacher	**0.004**	**0.003**
			Official	**0.001**	**0.003**
			Executive	**0.05**	**0.07**
			Freelance professional	**0.002**	**0.003**
			Entrepreneur	**0.008**	**0.05**
			Self-employed	**0.50**	**0.59**
			Unoccupied	**0.005**	**0.006**
	Ageson educdad jobtitledad jobsectdad	Job Sector	Agriculture	**0.42**	**0.81**
			Industry	**0.02**	**0.22**
			Public administration	**0.03**	**0.003**
			Trade	**0.01**	**0.46**
	Area educdad jobtitledad jobsectdad	Geographical Area	North	**0.061**	**0.255**
			Centre	**0.003**	**0.003**
			South	**0.540**	**0.774**

autonomous workers: the category of self-employed is composed of people who manage family activities so our value is influenced by the number of activities transmitted, such as medical, legal or business activities.

Considering job sectors, the highest value of β (0.42) occurs for agriculture. This is linked to the propensity for intergenerational transmission by employees in this sector (Corak and Piraino 2011).

Finally, we analyse the differences in intergenerational mobility between geographical areas. We partition Italy into the classical three regions: the more developed North, the Centre and a poorer and less developed South.[3] Our analysis shows that intergenerational mobility differs by region, but in this case we have very high rates in the poorest southern regions, where the weak market labour produces a scarcity of occupational opportunities.

These considerations show the rigidity and weakness of the labour market: where the level of education is inferior and in professional sectors requiring education we can say that the economic and working position of the father influences the economic and working position of the son.

In the last column of Table 12.6 we report the results of our TS2SLS estimation for disposable income. By carrying out this analysis we would like to go beyond the analysis of the labour market influence and to observe the transmission of economic status. The value of disposable income includes labour income and pensions, but also income from rents, financial capital and investments.

For disposable income, the value of intergenerational mobility is 0.68, higher than for labour income. Tables 12.6 and 12.7 showa similar trend of influence for job title and job sector, and some difference in educational level and most of all in regional distinction. While in the previous analysis we observed large variations in β for the different level of education, in this case the influence on this category is minimal. In contrast, for geographical area we by far the highest level for the South where the relation between father and son is much more linked to economic status and the transmission of heritage.

As we have said before, the economy of the South is the weakest in Italy. Here unemployment is highest, and the age of leaving home lowest: usually young sons abandon the parental home to change their lives and move to different regions of the country or to marry (Santerelli and Cottone 2009). In both cases parents help their sons by transmitting some of their heritage, land, house or monetary capital. This is the reason for the high value of β in this part of Italy.

The trend of intergenerational inequity and intergenerational mobility

In order to analyse the trend of intergenerational mobility we compare our result and those of Piraino. And to provide an international comparison we also consider the rates of intergenerational mobility in Germany, France and Finland as they are reported in Corak's (2013) Great Gatsby curve (Figure 12.1). Since these researchers have used fathers' labour income to measure intergenerational mobility, in Table 12.7 we report the value for labour income.

Table 12.7 Comparison of β-values

Our calculations (2013)	Italy	SHIW (2012–1989)	$\beta = 0.63$
Piraino (2006)	Italy	SHIW (2002–1977)	$\beta = 0.47$
Corak (2013)	United Kingdom	Corak	$\beta = 0.57$
	France	Corak	$\beta = 0.42$
	Germany	Corak	$\beta = 0.32$
	Finland	Corak	$\beta = 0.17$

Source: author's calculations

Considering the Italian situation and the comparison between our study and Piraino's study, we observe that the rate of β has experienced a significant increase: from a minimum level of 0.47 to a maximum level of 0.63. An international comparison shows that Italy has the highest value of β, close to the value for the UK and much larger than that for Finland. As we have already remarked, there are many reasons for these disparities: from the different social policies (job protection, minimum wage) to the propensity for intergenerational transmission of jobs and heritage.

To understand the evolution of intergenerational mobility elasticity in Italy, we investigate, for the years considered by us and the years considered by Piraino, some specific indices that we consider significant to show that the economic situation of young people is worsening and how this could increase the value of intergenerational mobility: the average income and the Gini index. In so doing, we would like to obtain evidence about not only equity between generations, but also equity within the same generations in different periods.

Several studies on intergenerational mobility make a comparison between the present state of affairs and the past 45/50 years, measuring the mobility of the under-forties in the early 2000s by their incomes or earnings and their parental income. But, as we noted previously, we have to consider the difference in starting points: parents of young people in 2000 grew up in a period of relative equality and of economic prosperity, while the younger generation considered in our sample are facing much more uneven economic conditions, and, especially in 2012 a severe economic crisis. Hence in this part we want to highlight the different *starting points* of the two samples.

Finally, we have to highlight that for all the data we have considered in the SHIW database and the study on intergenerational mobility, we have considered only males who have answered the part of the questionnaire relating to wages.

On the distribution of disposable income: the effect of economic crises

First, we look at the distribution of disposable income by age class in order to investigate if there is a worsening in the economic equity among younger generations (Figure 12.2). As we have said before, this measure utilizes labour income and pensions, but also income from rents, financial capital and investments. The decision to consider the distribution of disposable income instead of the distribution of labour income is linked to our attention to the dynamics of transmission of capital or investments from father to son.

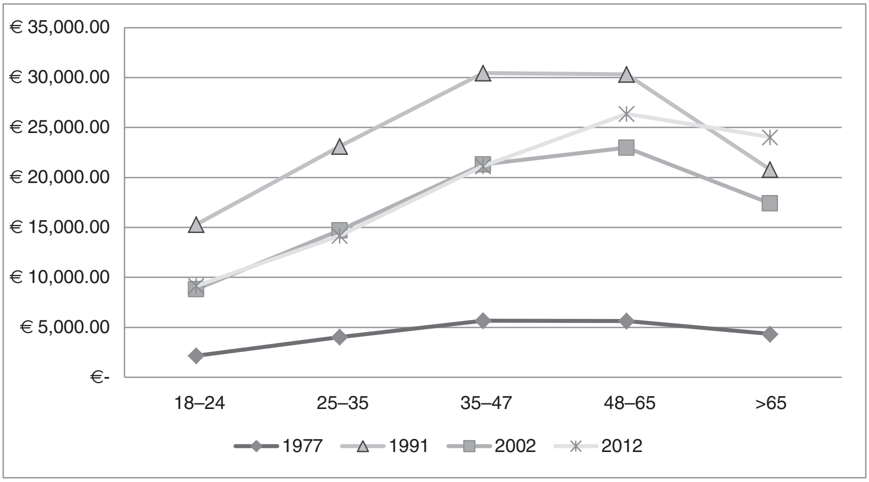

Figure 12.2 Average income by age class

Source: author's calculations from SHIW 1977, 1991, 2002, 2012

Figure 12.2 shows that in 1977, the time of Piraino's fathers sample, the curve was not particularly sloped and there were no sharp peaks. In contrast, in 2012, the time of the sons sample, there is an incremental trend with a peak for the people aged 48–65. The most marked difference is in 1991, when the average income for all age groups was higher than in other years. Considering the age group of our sample (35–47) the average disposable income was €30,467, while for the same group the disposable income in 2012 was €21.138. The reason for this difference is the better economic situation of Italy in that year. A recent study by Campiglio (2013) from the same data underlines that between 1991 and 2012 the share of disposable income compared to GDP fell sharply, from 74 per cent at the beginning of the 1990s to 66 per cent in 2012. This significant disparity in the redistribution of income over twenty years demonstrates the increase in inequality.

Finally, it is important to acknowledge that the big gap in disposable incomes between 1991 and 2012 is also influenced by the fall in household saving rates. After the economic crises the saving behaviour declined from 24 per cent in the early 1990s to 8 per cent in 2012. The decline in saving rates significantly influences our analysis and particularly the level of intergenerational mobility: saving behaviour generates distribution of wealth across generations, as a result of families decidking to save money for their children (De Nardi 2002).

The impact of inequity on intergenerational mobility: from the Gini index to the Great Gatsby curve

Intergenerational mobility is one of the determinants of intergenerational equity. As we have said before, the debate on this matter is evolving year by year. To gain a perspective of the level of inequality that young people have to face in Italy, we measure the Gini index and create an Italian Great Gatsby curve.

The trend in the Gini index measured on disposable income for the sample considered allows us to look at the equality level between age groups observed at the same time (intergenerational equity) and between the same age classes observed in different years (intragenerational equity). Figure 12.3 compares the index between our sample (males aged 35–47) and the rest of the working population (r.w.p., 18–65).[4] Both curves shown the same trend, with the same difference (0.06) between them for 1977 and 1991. The better situation is in 1991 with a very low rate of inequality for both fathers and the rest of the working population. In more recent years we have slightly narrower differences: 0.04 in 2002 and 0.05 in 2012. So the Gini Index shows no particular disparities from 2002 to 2012.

To obtain evidence of the evolution of intergenerational inequality linked to intergenerational mobility we use Corak's Great Gatsby curve, comparing Italy in different years as well as France, Germany, Finland and the UK. Figure 12.4 shows that in 2002 and 2012 income inequality and intergenerational mobility were not perfectly correlated: during these two years in fact there was a rise in intergenerational mobility from 0.47 to 0.63, while the rate of income inequality was stable at 0.32. So we can say that in 2012 we have an upward shift because of the increasing of intergenerational mobility: young people's prospects are strongly influenced by parental income, much more than ten years ago and much more than in countries like Finland or France.

Of course this immobile situation is connected to economic crises and to a weak labour market and particularly to the so-called 'flexibilization at the margin' (Esping-Andersen and Regini 2000) of atypical workers:[5] the difficulty of finding a job, the spread of temporary contracts and low wages create a hostile climate for young people who want to improve their economic conditions.[6]

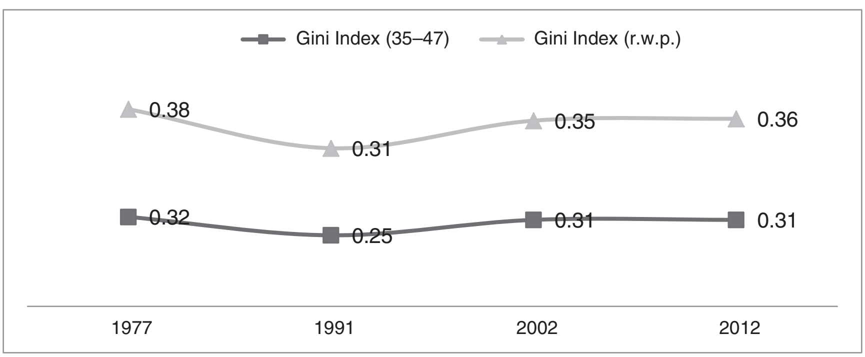

Figure 12.3 Gini index trend

Source: author's calculations from SHIW 1977, 1991, 2002, 2012

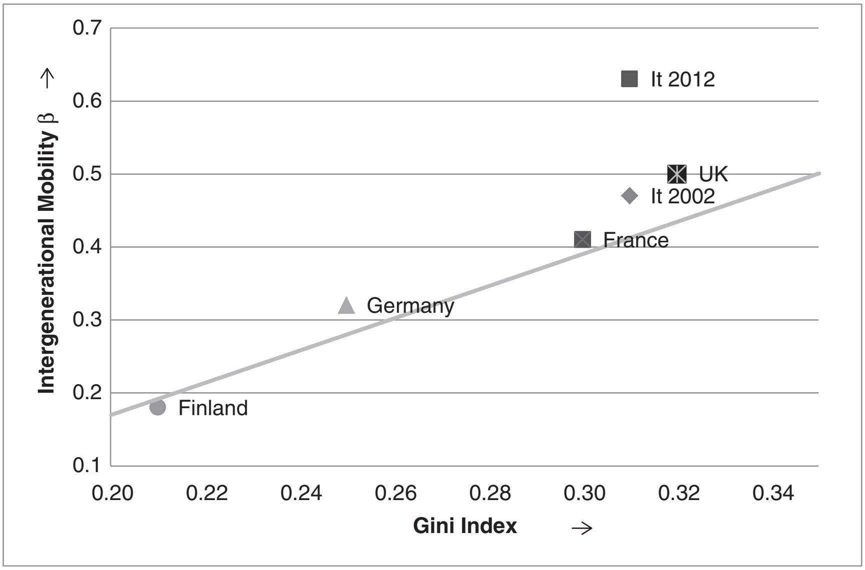

Figure 12.4 Great Gatsby curve

Source: author's calculations from SHIW and Corak's data

Concluding remarks

Intergenerational equity and intergenerational mobility must assume a central role in the global economic debate, and one of the principal reasons for this is the worsening of economic conditions for young people. In many developed countries, including Italy, new policies are required to deal with this situation and, as highlighted by our data, Italy can take some inspiration from the policies of northern countries.

In this chapter, we have compared the intergenerational mobility in Italy in the last decade using work by Piraino as our starting point. As a result, we can say that the Italian economic system is a very rigid structure and that young people are footing the largest part of the bill. Low wage levels, weak job security and the absence of appropriate policies are prejudicing the level of intergenerational equity and intergenerational mobility, reducing opportunities for young people.

We have especially underlined how the disparities between the North and South of Italy have a strong influence on intergenerational mobility because of the difficulties in finding a job better than that of one's parents, and most of all because of the propensity and necessity to depend, in the parental home, on family help.

Of course it is impossible for us to predict future scenarios, but if the economic crisis and the absence of appropriate policies continue, conditions for young people will continue to worsen.

Notes

1 The Great Gatsby curve was described for the first time by Alan Kruger in a speech to the Center for American Progress on January 12, 2012, and then drawn by Miles Corak,

according to this relation between the Gini index from a generation ago (*x*-axis) and Intergenerational elasticity (*y*-axis).

2 The two-sample two-stage least squares (TS2SLS) estimator, is commonly used in this field of research to combine two separate samples. This estimator is very similar to IV uses an instrumental variables, but the estimation comprehend two steps from two several samples (Francesconi and Nicoletti 2006).

3 'Italy is a unique European country having at once a per capita income in line with the continental average, together with a huge percentage of population (29 per cent) living in a province where per capita income is less than 75 per cent of EU average, as well as 26 per cent of population residing in a province with a level of per capita income equal to 125 per cent of the average' (Brida *et al*. 2014).

4 The Rest of Working Population is calculated in the following way: total male population aged from 18 to 65 less our sample.

5 Atypical work is a type of work that is done by what is often referred to as the 'flexible workforce'. This is a large and growing group of workers, most of whom are women (over 80 per cent of the flexible workforce). Examples of atypical workers include part-timers, those on fixed-term contracts, homeworkers, or those in a large number of other arrangements, such as seasonal work, casual work, telework, family work, or self-employment.

6 Gini's Country Report for Italy, 2012.

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Part III

Youth labour markets, NEET and the crisis

13 Youth re-employment probabilities in a gender perspective

The case of Italy

Chiara Mussida and Dario Sciulli

Introduction

The gender gap, that is to say, the differences between women and men, especially as reflected in social, political, intellectual, cultural, or economic attainments or attitudes, is still relevant as economic and policy issue, even after the crisis. The Global Gender Gap index, introduced by the World Economic Forum in 2006, provides a framework for capturing the magnitude and scope of gender-based disparities around the world. The index seeks to measure one important aspect of gender equality: the relative gaps between women and men across a large set of countries and across four key areas: health, education, economics and politics. The index benchmarks national gender gaps of 142 countries, taking into account a comprehensive set of supporting information that provides the broader context on gender parity laws, social norms, policies and outcomes within a country. In 2014 (World Economic Forum 2014), the index for Italy was only 4 percentage points lower than in 2006 (the first year of the report), falling from 60 per cent in 2006 to 56 per cent in 2014. The report also shows that gender equality of opportunities and outcomes are still far from being achieved, especially in the absence of specific policy interventions.

Since the 1950s, indeed, gender equality has been widely accepted as a socially and economically important goal in most industrialized countries. It is not only a moral value and an important policy to enable men and women to maximize their potential. It might also be a tool for economic and welfare growth, as gender equality means utilization of the full productive potential of the labour force.

In recent decades, significant progress has been made in reducing labour market gender inequalities in industrialized countries, but they are still persistent in most of them. Several studies have shown that women suffer disadvantages and penalties in terms of employment prospects, career promotions and wages.

The most recent data on Italy on the gender gap mentioned above places the country in 69th position out of the 142 countries included in the gender gap index analysis. In detail, whilst the index improved with respect to the previous year (2013), there has been a reduction in the index/equality with respect to the pre-crisis period. This is a result of both the negative effect of the crisis and the lack of effective policy interventions to enable the reconciliation of labour and family burdens and of gender equality policies in the labour market.

For these reasons the gender gap has been widely examined in the literature. In economics, a large body of empirical studies on labour market gender inequalities focuses on wage gaps. These have been studied, for instance, both in general in European countries by using data from the European Community Household Panel (ECHP) for the period 1999–2001 (Arulampalam *et al*. 2007) and more recently and specifically in Italy (e.g. Addabbo and Favaro 2011; Picchio and Mussida 2011), Spain (de la Rica *et al*. 2008) and the US (Olivetti and Petrongolo 2008).

This chapter analyses the gender gap in re-employment probabilities of young Italian people aged 15–34 for the period 1985–2004 by using data from the Work Histories Italian Panel (WHIP). Whilst most of the literature analyses the gender wage gap, the main contribution of this chapter is that we examine the gender gap in the hazard/re-employment probabilities in Italy. The gender gap of the youth hazard rates is rather unexplored in the literature, and as far as we know no studies have been carried out using WHIP data.

In addition, we analyse the gender gap of well-known disadvantaged labour market categories,[1] (i.e. young people in general and women). These are two important labour market categories and therefore our analysis might help understand the sources of their disadvantage.[2] For this reason we develop decompositions of the overall gender gap and, within gender, of some of the most relevant sources of the Italian labour market segmentation, such as geographical area, age, and occupational qualification (blue- and white-collar). Moreover, we account for changes in the gender gap because of the introduction of flexibility policies, focusing on the role of the so-called Treu Package (Law No. 196/1997).

These sources are quite important structural characteristics of the labour market in general and, within the labour market, of the composition of employment. As per the geographical analysis, the territorial duality is a well-known structural feature of the Italian labour market (Bertola and Garibaldi 2003; Ricciardi 1991). In terms of age, we analyse the gender gap within very young people in Italy (i.e. people aged 15–24), who are defined as a disadvantaged labour market category. Employment in Italy is typically characterized by a higher presence of males in blue-collar jobs, whereas females work more than males in white-collar jobs. For this reason, we analyse the gender gap within the blue-collar and white-collar occupational qualifications.

More generally, the aim of the decompositions is to examine the relevance of the components of the gender hazard rates gaps in Italy: the component due to differences in the distribution of individual/personal characteristics and/or productivity and the component due to differences in the distribution of unobserved characteristics which might involve discrimination and/or occupational segregation. This is a relevant issue from the policy perspective, and different implications are drawn depending on whether the source of the gender pay gap is the former or the latter. In addition, the adopted decomposition techniques offer measures of/insights into the gender gap in re-employment probabilities due to discrimination.[3]

Finally, the period analysed in this paper was characterized by important institutional and economic changes. Since the mid-1980s, the Italian labour market has been undergoing institutional changes aimed at increasing wage and employment flexibility and improving competitiveness, economic growth and employment opportunities. Our decomposition analysis, which looks also to a gender decomposition before and after the Treu Package, might give insights into the impact of the (main) legislative changes on the gender gap in re-employment opportunities.

We begin by sketching the theoretical background. We then describe the econometric approach used to estimate the re-employment probabilities/hazard of young people and present the decomposition analysis. Next we describe the WHIP data and present the main descriptive statistics on the variables used and on the hazard rates. We then describe the results of both the hazard estimation and the decomposition analysis. We round off the chapter with our conclusions.

Theoretical background

The theoretical literature suggested a number of mechanisms justifying gender gap in labour market opportunities. When investigating the gender gap in re-employment probabilities among Italian youth, we devote specific attention to two streams of theoretical literature: that referring to the household allocation of time and that referring to searching for work.

The theory of the allocation of time (e.g. Becker 1965; Gronau 1977) provides several starting points for explaining the gender gap, including that concerning re-employment probabilities. In that context, the presence of children in the household and marital status may introduce gender disparities in labour supply, housework activities and leisure, resulting in different propensities for being re-employed for males and females. In particular, while the number of children in the household uniformly affects the housework and leisure of both males and females, it has a downward effect on the female labour supply and a positive one on males. According to model predictions, gender differences also emerge because of marital status. In fact, while being married increase the labour supply of males, the impact on females may depend on the husband–wife wage ratio, while marital instability should increase the labour force participation of females.

Job-search theory (Petrongolo and Pissarides 2001; Pissarides 2000) also offers useful insights into the variables/characteristics which may play an important role in accounting for differences in search intensity and reservation wage and subsequently on labour market participation. Firstly, there are individual characteristics, such as gender, and more general aggregate and demographic variables, such as individual age. As for the latter, it is often assumed that the young search with a lower intensity than adults. Or there may be variables that influence the cost of search and moving, such as unemployment insurance variables and housing transaction costs.

In general, leisure from non-participation is strictly greater than leisure during search, especially for females, for at least two kinds of reasons. First, there may be direct search costs of various kinds, even for a fixed intensity of search. Second, and more importantly, there may be indivisibilities in the use of leisure time. Those include various non-market activities, such as bringing up children, household labour, home improvements, and travelling, which require a long time to complete. Persons who decide not to enter the labour force are able to participate in these activities and enjoy their full returns. Persons who decide to enter the market and are looking for a job cannot take full advantage of them because they know that their free time is likely to be short and of uncertain duration. They are essentially standing in a queue waiting for a call and unable to commit themselves to long-term non-market activities. In addition, it should be considered that housework activities/labour and caring responsibilities could decrease search intensity, reducing re-employment probabilities. Again, this would be particularly relevant for females as in Italy care activities are usually provided by women, and also because of the breadwinner model (e.g. Pascall and Lewis 2004).

Econometric methods

Duration analysis

We estimate the re-employment probabilities of young people using discrete-time hazard models.[4] The conditional probability that a transition to employment, either permanent or atypical, takes place in a given interval $[a_{j-1}, a_j)$ in the jth period, conditional on the time already spent in non-employment, is defined as

$$h_j \equiv \Pr\left\{T \in [a_{j-1}, a_j) \mid T \geq a_{j-1}\right\}, \tag{13.1}$$

where the jth realization of the discrete random variable T is the recorded spell duration, assuming unit-length intervals.

A discrete-time hazard model requires data organized into a ‘sequential binary form’. This implies that data form an unbalanced panel of individuals with the ith individual contributing to $j = 1, 2, \ldots,$ **t** observations, where **j** is the number of periods at risk of the event.[5] Since some individuals transit to employment and possibly revert back to non-employment, multiple spells may be observed, $q = 1, 2, \ldots, Q$.

Models are estimated assuming independent competing risks and this allows estimation of models separately for each destination state (Narendranathan and Stewart 1993). We adopt a logistic specification, assuming that survival times are intrinsically discrete. The resulting discrete-time hazard model is also known as the proportional odds model. The logistic model assumes that the relative odds of making a transition in period j, conditional on being in the state at risk up to the end of the period, is

$$\frac{h_{ij}}{1-h_{ij}} = \left[\frac{h_j(0)}{1-h_j(0)}\right]\exp\left(\beta' x_i\right), \tag{13.2}$$

where h_{ij} is the discrete time hazard rate for period j and $h_j(0)$ is the corresponding baseline hazard. The relative odds of exiting from non-employment may be written as

$$\operatorname{logit}\left[h_{ij}\right] = \log\left[\frac{h_{ij}}{1-h_{ij}}\right] = \alpha_j + \beta' x_{ij}, \tag{13.3}$$

where

$$h_{ij} = \frac{1}{1+\exp\left(-\alpha_j - \beta' x_i\right)} \ . \tag{13.4}$$

The model is estimated by maximum likelihood, and the partial log-likelihood function for each destination, permanent contract (PC) or atypical contract (AC), is

$$\begin{aligned}\log L = &\left[\sum_{i=1}^{n}\sum_{q=1}^{Q}\sum_{j=1}^{t}\left[y_{iqj}\log_{iqj}\left(t \mid x\right) + \left(1-y_{iqj}\right)\log\left(1-h_{iqj}\left(t \mid x\right)\right)\right]\right]_{PC} \\ &+\left[\sum_{i=1}^{n}\sum_{q=1}^{Q}\sum_{j=1}^{t}\left[y_{iqj}\log_{iqj}\left(t \mid x\right) + \left(1-y_{iqj}\right)\log\left(1-h_{iqj}\left(t \mid x\right)\right)\right]\right]_{AC}\end{aligned} \tag{13.5}$$

where y_{iqj} takes the value one if the transition of the individual i in spell q takes place in month j (i.e. the spell is uncensored) and zero otherwise. Because of the independence assumption, the total log-likelihood function is the sum of the partial log-likelihood functions derived for the contracts of destination PC and AC.

We assume a non-parametric specification of the baseline hazard. In particular, we adopt piecewise constant exponential specification: groups of months are assumed to have the same hazard rate, but the hazard may differ between groups. The total spell of non-employment is divided into specific sub-spells for specific groups of months.[6]

Finally, not accounting for unobserved heterogeneity might lead to biased estimates of the baseline hazard as well as the explanatory variable effects on the hazard of leaving non-employment. It follows that, for comparative purposes, we also run models accounting for Gaussian distributed random effects. However, because decomposition techniques are based on a standard logistic model, our benchmark estimations are those obtained from models not accounting for unobserved heterogeneity.

Decomposition analysis

The decomposition analysis is performed by applying a generalization of the Blinder–Oaxaca decomposition method, as Bauer and Sinning (2008) proposed for non-linear models.[7] This allows the decomposition of outcome variables between explained and unexplained differentials, due to, in turn, differences in observed characteristics and differences in the estimated coefficients. In particular, Bauer and Sinning (2008) proposed the following general version of the Blinder–Oaxaca decomposition for the groups $g = A, B$ for non-linear regression models (NL) by taking A as reference group:

$$\begin{aligned}\Delta_A^{NL} = & \left\{E\beta_A\left(Y_{iA} \mid X_{iA}\right) - E\beta_A\left(Y_{iB} \mid X_{iB}\right)\right\} \\ & + \left\{E\beta_A\left(Y_{iB} \mid X_{iB}\right) - E\beta_B\left(Y_{iB} \mid X_{iB}\right)\right\}\end{aligned} \tag{13.6}$$

where $E\beta_g\left(Y_{ig} \mid X_{ig}\right)$ refers to the conditional expectation of Y_{ig}, and $E\beta_l\left(Y_{il} \mid X_{il}\right)$ refers to the conditional expectation of Y_{il} evaluated at the parameter vector β_g, with $g, l = A, B$ and $g \neq l$.

Oaxaca and Ransom (1994) generalized the Oaxaca–Blinder decomposition, proposing an intermediate specification with respect to that above for linear model that can be obtained defining a weighted average, β^*, of the coefficient vectors β_A and β_B:

$$\beta^* = \Omega\beta_A + \left(1-\Omega\right)\beta_B \tag{13.7}$$

where Ω is a weighting matrix and I is an identity matrix. The generalized decomposition for linear models takes the form

$$\begin{aligned}\bar{Y}_A - \bar{Y}_B = & \left\{E_{\beta^*}\left(Y_{iA} \mid X_{iA}\right) - E_{\beta^*}\left(Y_{iB} \mid X_{iB}\right)\right\} \\ & + \left\{E_{\beta A}\left(Y_{iA} \mid X_{iA}\right) - E_{\beta^*}\left(Y_{iA} \mid X_{iA}\right)\right\} \\ & + \left\{E_{\beta^*}\left(Y_{iB} \mid X_{iB}\right) - E_{\beta B}\left(Y_{iB} \mid X_{iB}\right)\right\}.\end{aligned} \tag{13.8}$$

The application of the Oaxaca and Ransom (1994) decomposition to non-linear models requires to substitution of $E\beta_g\left(Y_{ig} \mid X_{ig}\right)$, $E\beta_l\left(Y_{ig} \mid X_{ig}\right)$ and $E\beta_g\left(Y_{ig} \mid X_{ig}\right)$ respectively with the derived sample counterparts, $S\left(\hat{\beta}_g \mid X_{ig}\right)$, $S\left(\hat{\beta}_h \mid X_{ig}\right)$ and $S\left(\hat{\beta}^* \mid X_{ig}\right)$.

Different assumption can be made about the form of Ω. Reimers (1983) proposed $\Omega = 0.5I$, while Cotton (1988) proposed $\Omega = s\mathrm{I}$, where s denotes the relative sample size of the majority group. Finally, Neumark (1988) and Oaxaca and Ransom (1994) proposed a weighting scheme to define Ω, based on an estimation of a pooled model to derive the counterfactual coefficient vector β^*.

The outcomes of the Oaxaca–Blinder decomposition report three components to explain the raw differential, namely the effect due to different distributions of individual characteristics, the effect due to different returns on those characteristics (coefficients), and differences due to the interaction between characteristics and returns/coefficients, following the extension of Daymont and Andrisani (1984). Conversely, when considering the alternative weighting schemes proposed, in turn, by Reimers (1983), Cotton (1988), and Neumark (1988) and Oaxaca and

Ransom (1994), the outcomes of the decomposition analysis include productivity, advantage of the high group and disadvantage of the low group. Specifically, productivity is an estimate of the productivity differential between the two groups (similarly to the differences in characteristics), the non-discriminatory re-employment probability structure; advantage identifies the gap in favour (advantage) of the high group computed with respect to the non-discriminatory hazard; finally, disadvantage identifies the gap against the low group computed with respect to the non-discriminatory hazard. In other words, the advantage and disadvantage terms represent a decomposition of differences in coefficients.

Data

The WHIP is a database of 1985–2004 individual working histories based on the Italian Social Security Administration (INPS) archives, and consists of a representative sample of the population of employees of the private sector (excluding agriculture), apprentices, self-employed, and atypical contracts. The sample–population ratio is 1:180 for an overall dynamic population of around 370,000 individuals.

The database permits the identification of job relationships on the basis of the social security contributions paid monthly to the INPS by employers and workers. Non-employment (NE) spells are therefore identified as periods characterized by the absence of paid social security contributions by both employers and workers. Since survival time occurs in continuous time but the spell lengths are observed only at monthly intervals, the data are actually interval-censored. Nonetheless, even though the data are available only up to 2004, the use of the WHIP dataset is recommended for at least two reasons. First, it provides monthly information on private employment relationships, permitting the precise estimation of the time of transitions. Second, the data allow evaluation of the effects of the gradual introduction of flexible employment contracts into the Italian labour market, through several steps.[8]

From the type of contribution rebates it is possible to identify the contractual forms held by individuals – permanent contracts (PC) or atypical contracts (AC) (including on-the-job training contracts (OJTC) and temporary agency contracts (TAC) – making a competing risks analysis possible.

From the original sample, we selected information for young individuals in the age range 15–34 in the period analysed. This selection resulted in a subsample of 40,021 individuals and 100,443 spells, corresponding to 1,977,007 times at risk. This selection also enabled us to reconstruct complete individual working histories with accuracy and, since we can observe workers from the beginning of their careers, the impact of initial-condition problems is reduced.[9] The first month of a new employment relationship permits identification of the time of exit from the state of non-employment, and the type of contract that characterizes the new job makes it possible to identify the multiple failures characterizing the competing risks analysis. Since TACs only represent a small share of exit contracts, they are considered together with OJTC as atypical contracts.

The WHIP data makes a set of individual and job-related variables available. Specifically, information is provided on age, gender, working area, firm size, illness, wage, sector of economic activity, occupational qualification and cumulated previous work experience in permanent and atypical contracts. In the case of the working characteristics, these refer to the conditions holding during previous work experience.

Table 13.1 reports summary statistics of the most relevant variables used in the econometric analyses computed by gender and for the total sample.[10] We consider a continuous variable for age and the average age of the individuals in our sample is around 23 years of age and slightly higher for females than males.

Two dummy variables for the geographical area of residence (North-Centre and South) are included in the model specification. Around three quarters of the sample live in the northern and central Italy, especially females. A dummy variable captures whether the previous work experience of young people was in a blue-collar occupation. On average almost 80 per cent of the total sample were blue-collar workers, and the percentage is higher for males (around 88 per cent) than females (68 per cent). We distinguish between four firm sizes: 0–9, 10–19, 20–199, and 200 or more employees. Around one half of the sample has worked in small firms and this is in line with the structural characteristics of the Italian economy which is typically characterized by the prevalence of small firms. A dummy indicator accounting for self-perceived health captures the effect of health status (illness periods) on the re-employment probabilities/opportunities. We also control for the individual net wage of the employee. A set of dummies capture the sector of economic activity.[11] Around a half of the total sample has worked in manufacturing and construction, especially males. These sectors are indeed typically characterized by male employment. As for the other sectors examined, there is a prevalence of females in commerce and tourism. We distinguish between cumulated work experience (in months) in PC and AC and we find differences between genders. Whilst young men do show higher cumulated/previous experience in AC, females have higher cumulated experience in stable/permanent employment. The business-cycle effect is controlled for by introducing the expected (next quarter) employment growth rate and by assuming rational expectations.[12] The average expected employment growth rate during the period 1985–2004 is positive. Finally, a dummy variable is used to split the overall period before and after the introduction of the Treu Package (June 1997).

It is worth underlining that although the use of the WHIP dataset for analyses of non-employment duration is recommended for a host of reasons, it has at least three relevant limitations. First, individuals in the labour market states of unemployment and inactivity are collapsed into the category of non-employed. Second, self-employed and public sector employed are not included in our dataset, whilst the self-employed are excluded from the analysis.[13] Finally, because firms pay the same rate of social security contribution for permanent and fixed-term contracts[14] (a social contribution rate at 31 per cent of gross earnings), and also because both PCs and FTCs do not provide any tax relief (Cappellari *et al*. 2012), FTCs are assimilated into PCs in the WHIP data.

Table 13.1 Descriptive statistics by gender and total, 1985–2004

	All		*Male*		*Female*	
	Mean	*Std Dev.*	*Mean*	*Std Dev.*	*Mean*	*Std Dev.*
Age	23.165	4.321	22.967	4.371	23.476	4.224
Male	0.610	0.488	–	–	–	–
North-Centre	0.766	0.424	0.734	0.442	0.815	0.388
Blue-collar	0.803	0.398	0.883	0.321	0.678	0.467
Missing firm size	0.211	0.408	0.214	0.410	0.208	0.406
Firm size 0–9	0.359	0.480	0.361	0.480	0.355	0.479
Firm size 10–19	0.120	0.325	0.122	0.327	0.118	0.323
Firm size 20–199	0.195	0.396	0.199	0.399	0.189	0.392
Firm size over 200	0.114	0.318	0.104	0.306	0.130	0.336
Illness period	0.080	0.272	0.085	0.279	0.072	0.259
Wage	51.704	45.477	50.745	39.193	53.203	53.817
Manufacturing	0.302	0.459	0.321	0.467	0.272	0.445
Buildings	0.125	0.331	0.198	0.399	0.011	0.103
Commerce	0.131	0.337	0.111	0.315	0.162	0.368
Tourism	0.161	0.367	0.139	0.346	0.195	0.396
Transport	0.037	0.189	0.049	0.216	0.019	0.136
Business-intermediation	0.137	0.343	0.116	0.321	0.169	0.374
Other sectors	0.107	0.310	0.066	0.248	0.172	0.378
Cumulated PC	16.426	26.301	15.465	24.868	17.927	28.332
Cumulated AC	6.340	11.623	6.770	11.879	5.669	11.179
Expected employment growth	0.561	1.586	0.541	1.588	0.593	1.582
After Treu Package	0.670	0.470	0.662	0.473	0.683	0.465
Number of spells	100,443		61,258		39,185	

Source: authors' calculations on WHIP data.

Table 13.2 reports the average hazard rates for both males and females. We distinguish by exit contract and some relevant characteristics, namely working area, age, occupational qualification, and timing of institutional change. The overall average hazard rate for males leaving non-employment through a permanent contract is 0.03, while it is 0.029 for females. It follows that the relative differential is just 3.8 per cent. Looking at specific subgroups, we note that females show a higher hazard rate than males, when living in the North-Centre of Italy, young and white-collar workers. The advantage is, overall, quite small and equal, respectively, to 3.6 per cent, 4.6 per cent and 8.2 per cent. In addition, females show a higher hazard rate than males in the pre-reform period. This is possibly suggestive of a selection into specific segments of the labour market of females with better job characteristics favouring the exit from non-employment through permanent contracts. Females are particularly disadvantaged compared with males in the South of Italy, since the hazard rate is lower by about 50 per cent compared to males. Similarly, the probability of leaving non-employment through permanent contracts is lower for blue-collar females and in the post-reform period, indicating that institutional changes exacerbated gender duality. When looking at transitions

Table 13.2 Average hazard rates: gender raw differential

	PC			*AC*		
	Male	*Female*	Δ%	*Male*	*Female*	Δ%
Overall	0.03013	0.02902	3.81%	0.01068	0.00913	16.95%
North-Centre	0.03254	0.03377	−3.64%	0.01327	0.01114	19.19%
South	0.02530	0.01674	51.11%	0.00552	0.00395	39.88%
Aged 15–24	0.03179	0.03332	−4.59%	0.01710	0.01550	10.37%
Aged 25–34	0.02843	0.02565	10.84%	0.00416	0.00414	0.38%
Blue-collar	0.02959	0.02571	15.09%	0.01122	0.00992	13.11%
White-collar	0.03452	0.03762	−8.23%	0.00638	0.00709	−10.01%
Before Treu Package	0.02899	0.03265	−11.20%	0.01182	0.00947	24.84%
After Treu Package	0.03063	0.02770	10.58%	0.01018	0.00901	12.99%

Source: authors' calculations on WHIP data.

towards atypical contracts, we find that the raw gender gap against females is about 17 per cent. Looking at specific subgroups, we note that just being white-collar means a higher hazard rate for females than males (by about 10 per cent). The advantage of males is above the average value, in the South of Italy (about 40 percent), and before of the introduction of the Treu Package.

Results

Hazard model estimates

Table 13.3 reports the odds ratio resulting from the application of the logit hazard model.[15,16] The odds ratio is defined as the ratio of the probability of success to the probability of failure, and provides a simple and direct interpretation of estimation results, at least for binary covariates. In our case, a specific odds ratio indicates how many times the probability of leaving non-employment attached to a specific covariate is greater than the reference value of the same covariate. It follows that an odds ratio greater than one indicates a positive effect of a covariate on the hazard rate, whereas an odds ratio lower than one is indicative of a negative effect.

Looking at transitions towards PC, we note that age has an inverted U effect on the probability of leaving non-employment via PC. We also find that the probability of leaving non-employment is 11 per cent greater for males than for females (reference category). Working in the North-Centre of Italy increases by about 27 per cent the probability of leaving non-employment with respect individuals working in the South. Conversely, blue-collar workers are less likely (by about 12 per cent) than white-collar to leaving non-employment via PC. In addition, having worked in large firms significantly increases the probability of leaving non-employment by PC. Those employed in small firms (size 1–9) have about a 10 per cent lower probability of finding a PC. The probability increases as firm

Table 13.3 Logit hazard model estimation results

	PC		*AC*	
	Odds Ratio	*Std. Err.*	*Odds Ratio*	*Std. Err.*
Age	1.818	0.024 ***	0.679	0.015***
Age squared	0.989	0.000***	1.005	0.000***
Male	1.110	0.013***	1.022	0.019
North-Centre	1.271	0.015***	2.005	0.045***
Blue-collar	0.877	0.012***	1.163	0.031***
Firm size 1–9	0.899	0.015***	0.958	0.026
Firm size 10–19	1.033	0.020*	0.919	0.029***
Firm size 20–199	1.072	0.018***	0.877	0.026***
Firm size 200+		base-category		
Illness period	0.946	0.016***	1.102	0.032***
Wage	1.000	0.000***	0.997	0.000***
Manufacturing		base-category		
Building	0.976	0.017	0.831	0.021***
Commerce	0.877	0.014***	0.958	0.023*
Tourism	1.151	0.019***	0.708	0.017***
Transport	1.248	0.033***	0.815	0.042***
Intermediation-business	1.002	0.017	1.059	0.029**
Other sectors	0.922	0.016***	0.700	0.022***
Cumulated PC	1.004	0.000***	0.994	0.001***
Cumulated AC	1.005	0.000***	1.011	0.001***
Expected employment growth	1.046	0.003***	1.141	0.006***
Treu package	0.877	0.011***	1.618	0.031***
Number of observations		1977007		
Wald $\chi^2(29)$	33,416.84		18,458.36	
Prob > χ^2	0.000		0.000	
Pseudo R^2	0.097		0.120	
Log pseudolikelihood	–238,577.24		–98,029.08	

Source: authors' calculations on WHIP data.

size increases. Individuals with recorded illness periods also experience a lower re-employment probability via PC (about 5 per cent less) when compared to the reference category, while wages earned in the previous job have a significant but negligible impact on the re-employment probabilities. In addition, with reference to the manufacturing sector (the base category), some economic sectors are associated with a greater probability of leaving non-employment via PC (tourism, +15 per cent; transport, +24 per cent), while other sectors are associated with a negative effect (building, –2.5 per cent; commerce, –12 per cent; and the residual category other sectors, –8 per cent). Cumulating job experiences, both by PC and AC, increases the probability of leaving non-employment via PC. Moreover, as expected, a positive business cycle is also associated with a greater probability of leaving non-employment via PC. Finally, the introduction of the Treu Package has reduced the probability of leaving non-employment via PC by about 12 per cent.

When looking at the probability of leaving non-employment by AC, we note some relevant differences with respect to the previous case. The effect of age is now U shaped, indicating that the probability of re-employment via AC is higher for very young individuals. Interestingly, we do not find a significant gender effect. In addition, the probability of leaving non-employment via AC is about double in the North-Centre what it is in the South. Blue-collars are more likely to move to an AC (+16 per cent), suggesting duality by professional type in terms of exit contract. The firm size effect is the reverse of our findings for transitions to PC. In fact, the probability of leaving non-employment by AC decreases as the firm size related to the previous occupation increases. Previous illness periods increase the probability of leaving non-employment by AC (by about 10 per cent). Similarly, previous wage has a significant but negligible effect on the probability of re-employment via AC. Looking at economic sector indicators, we find that a positive effect (with respect to the manufacturing sector) exists just for the intermediation-business sector (by about 6 per cent). Conversely, other sectors are associated with a negative effect (building, –17 per cent; commerce, –4 per cent; tourism, –29 per cent; transport, –19 per cent; and other sectors, –30 per cent). Previous PC experience decreases the probability of leaving non-employment via AC, while previous AC experience has a positive effect. Similarly to above, a positive business cycle is associated with a greater probability of leaving non-employment via AC. In any case, the effect is higher when compared to the positive effect we find for NE–PC transitions. Finally, the introduction of the Treu Package has increased the probability of leaving non-employment via AC (+62 per cent). Combined with our previous finding, it seems that the introduction of new atypical contracts and the reform of those existing has produced relevant effects in the Italian labour market, at least in terms of the employment prospects of young individuals.

Decomposition analysis

Tables 13.4–13.8 report the decomposition analysis carried out using the Blinder–Oaxaca technique for non-linear outcomes. We adopt five alternative specifications for the Ω weighting matrix: the one and zero matrix (using Blinder–Oaxaca decomposition), Reimers (1983), Cotton (1988), Neumark (1988) and Oaxaca and Ransom (1994) specifications. We analyse the overall hazard rates gaps by gender (Table 13.4) and, within gender, by geographical area (North-Centre and South of Italy), age (15–24), classification of occupation (blue-collar and white-collar), and before and after the Treu Package (Tables 13.5–13.8). We therefore consider some of the most important sources of segmentation in the Italian labour market.

The aim of this exercise is primarily to examine the relevance of the components of the gender hazard rates gaps in Italy – the component due to differences in the distribution of personal/individual characteristics (characteristics) and that due to different remuneration of those characteristics (coefficients). This is a relevant issue from the policy perspective, and different implications are drawn depending on whether the source of the gender pay gap is the former or the latter.

In addition, the decomposition technique adopted offers insights into the interaction between the two components of the gender gap (interactions).

The extensions/alternative weighting schemes suggested by Neumark (1988) and Oaxaca and Ransom (1994) give information about three terms of the raw gender differential: the productivity, advantage and disadvantage terms. The decompositions are carried out by contract type (permanent and atypical), to examine the gender differences between the related re-employment probabilities.

Looking at the decomposition by gender (Table 13.4), we find that the raw hazard rate differentials for both the transitions to permanent and atypical contracts are higher for males than females by 0.00111 and 0.00156 in absolute values, respectively. Nonetheless, differences by contract type between the components of the re-employment probabilities do emerge. Interestingly, for exits to PC, the differential due to differences in productivity is –0.00139, indicating that productive characteristics favour the re-employment probabilities of females for this specific segment of the Italian labour market. A possible explanation of this finding is the quite strong impact/effect of the selection of females into the Italian labour force because of high education and living in the cNorth-Centre. The individual characteristics of women, indeed, help reduce the gender gap (–0.00269).

There is evidence, therefore, that women are overall and strongly more positively selected into the workforce than men: the women who stayed out of employment/labour market were those who would have earned the lowest returns (e.g., lower qualifications) with a higher probability than men. The overall sign of the hazard in favour of males, therefore, suggests the presence of discrimination against females in terms of re-employment prospects with permanent contracts. Even though those selected in the labour market (PC) are those with the higher returns; women in general (both higher and lower qualified) have lower hazard of finding permanent employment. With respect to the unfair differential, indeed, we find that the advantage and the disadvantage terms are +0.00099 and +0.00150 respectively, suggesting both the existence of a positive gap for males and a negative gap for females with respect to the fair hazard.

A different picture emerges when looking at the components of the gender gap in re-employment probabilities with atypical contracts reported in the bottom panel of Table 13.4. According to our decomposition analysis, almost 87 per cent (the average for the three alternative specifications of the weighting matrix Ω) of this differential is explained by differences in productive characteristics, whilst the remaining 13 per cent is explained by unfair differences. First, this indicates that females do not seem discriminated/disadvantaged when analysing the re-employment probabilities with atypical contracts. Second, this finding could be partly explained in terms of selection of low productive females into the atypical employment segment, in line with the speculation mentioned above about the high productive females selected into permanent employment. In other words, it seems that while high and low productive males are quite homogenously distributed between permanent and atypical employment, high productive females are more prone to be selected into permanent jobs, whilst low productive females are more likely to be confined to atypical employment or excluded from the labour force/market. This explanation

Table 13.4 Overall gender gap decomposition

Group	Type of contract	Raw Differential		Ω = 1		Ω = 0			Ω = 0.5		Ω = sI		Ω = wgt	
		hM – hF		Coeff.	%	Coeff.	%		Coeff.	%	Coeff.	%	Coeff.	%
Overall	PC	0.00111	Characteristics	–0.00269	–243.4%	–0.00119	–107.2%	Productivity	–0.00196	–176.8%	–0.00180	–162.9%	–0.00139	–125.5%
			Coefficients	0.00229	207.2%	0.00380	343.4%	Advantage	0.00214	193.1%	0.00174	157.5%	0.00099	89.8%
			Interactions	0.00151	136.2%	–0.00151	–136.2%	Disadvantage	0.00093	83.6%	0.00117	105.4%	0.00150	135.8%
	AC	0.00156	Characteristics	0.00121	78.1%	0.00149	95.5%	Productivity	0.00135	86.5%	0.00137	88.3%	0.00137	88.3%
			Coefficients	0.00007	4.5%	0.00034	21.9%	Advantage	0.00023	14.5%	0.00019	12.2%	0.00007	4.7%
			Interactions	0.00027	17.4%	–0.00027	–17.4%	Disadvantage	–0.00002	–1.0%	–0.00001	–0.4%	0.00011	7.0%

Source: authors' calculations on WHIP data.

Table 13.5 Gender gap decomposition by working area

Group	Type of contract	Raw Differential		Ω = 1		Ω = 0			Ω = 0.5		Ω = sI		Ω = wgt	
		hM – hF		Coeff.	%	Coeff.	%		Coeff.	%	Coeff.	%	Coeff.	%
North-Centre	PC	–0.00123	Characteristics	–0.00273	222.2%	–0.00182	148.1%	Productivity	–0.00224	182.8%	–0.00217	176.7%	–0.00227	184.8%
			Coefficients	0.00059	–48.1%	0.00150	–122.2%	Advantage	0.00089	–72.6%	0.00076	–62.2%	0.00043	–35.4%
			Interactions	0.00091	–74.2%	–0.00091	74.2%	Disadvantage	0.00012	–10.1%	0.00018	–14.4%	0.00061	–49.4%
	AC	0.00214	Characteristics	0.00236	110.7%	0.00243	113.9%	Productivity	0.00239	112.0%	0.00240	112.2%	0.00227	106.2%
			Coefficients	–0.00030	–13.9%	–0.00023	–10.7%	Advantage	–0.00004	–1.7%	–0.00002	–1.0%	–0.00006	–2.6%
			Interactions	0.00007	3.3%	–0.00007	–3.3%	Disadvantage	–0.00022	–10.2%	–0.00024	–11.3%	–0.00008	–3.6%
South	PC	0.00856	Characteristics	0.00017	2.0%	0.00165	19.3%	Productivity	0.00078	9.1%	0.00100	11.7%	0.00253	29.6%
			Coefficients	0.00690	80.7%	0.00839	98.0%	Advantage	0.00477	55.7%	0.00353	41.2%	0.00214	25.1%
			Interactions	0.00148	17.3%	–0.00148	–17.3%	Disadvantage	0.00301	35.2%	0.00403	47.1%	0.00388	45.3%
	AC	0.00158	Characteristics	0.00022	14.2%	0.00073	46.5%	Productivity	0.00040	25.4%	0.00048	30.3%	0.00081	51.6%
			Coefficients	0.00084	53.5%	0.00135	85.8%	Advantage	0.00082	52.1%	0.00062	39.2%	0.00027	17.2%
			Interactions	0.00051	32.2%	–0.00051	–32.2%	Disadvantage	0.00035	22.5%	0.00048	30.5%	0.00049	31.2%

Source: authors' calculations on WHIP data.

Table 13.6 Gender gap decomposition by age

Group	*Type of contract*	*Raw Differential*		$\Omega = 1$		$\Omega = 0$			$\Omega = 0.5$		$\Omega = sI$		$\Omega = wgt$	
		hM – hF		*Coeff.*	%	*Coeff.*	%		*Coeff.*	%	*Coeff.*	%	*Coeff.*	%
Age 15–24	PC	–0.00152	Characteristics	–0.00328	215.2%	–0.00186	122.3%	Productivity	–0.00255	167.3%	–0.00236	155.0%	–0.00248	162.6%
			Coefficients	0.00034	–22.3%	0.00176	–115.2%	Advantage	0.00119	–78.1%	0.00093	–61.3%	0.00035	–22.9%
			Interactions	0.00142	–92.9%	–0.00142	92.9%	Disadvantage	–0.00016	10.8%	–0.00010	6.3%	0.00061	–39.7%
	AC	0.00161	Characteristics	0.00054	33.6%	0.00122	76.0%	Productivity	0.00088	54.5%	0.00097	60.2%	0.00108	67.0%
			Coefficients	0.00039	24.0%	0.00107	66.4%	Advantage	0.00063	39.1%	0.00048	29.8%	0.00019	12.1%
			Interactions	0.00068	42.4%	–0.00068	–42.4%	Disadvantage	0.00010	6.4%	0.00016	10.0%	0.00034	20.9%

Source: authors' calculations on WHIP data.

Table 13.7 Gender gap decomposition by occupational qualification

Group	*Type of contract*	*Raw Differential*		$\Omega = 1$		$\Omega = 0$			$\Omega = 0.5$		$\Omega = sI$		$\Omega = wgt$	
		hM – hF		*Coeff.*	%	*Coeff.*	%		*Coeff.*	%	*Coeff.*	%	*Coeff.*	%
Blue-collar	PC	0.00388	Characteristics	0.00030	7.7%	–0.00016	–4.0%	Productivity	0.00009	2.3%	0.00002	0.5%	0.00040	10.3%
			Coefficients	0.00404	104.0%	0.00358	92.3%	Advantage	0.00201	51.9%	0.00146	37.5%	0.00121	31.3%
			Interactions	–0.00045	–11.7%	0.00045	11.7%	Disadvantage	0.00178	45.8%	0.00240	62.0%	0.00227	58.4%
	AC	0.00130	Characteristics	0.00072	55.5%	0.00093	71.3%	Productivity	0.00083	63.7%	0.00086	66.1%	0.00086	66.1%
			Coefficients	0.00037	28.7%	0.00058	44.5%	Advantage	0.00035	26.7%	0.00026	19.6%	0.00015	11.8%
			Interactions	0.00021	15.8%	–0.00021	–15.8%	Disadvantage	0.00012	9.6%	0.00019	14.3%	0.00029	22.1%
White-collar	PC	–0.00310	Characteristics	–0.00217	70.0%	–0.00117	37.7%	Productivity	–0.00165	53.4%	–0.00153	49.4%	–0.00179	58.0%
			Coefficients	–0.00193	62.3%	–0.00093	30.0%	Advantage	–0.00026	8.4%	–0.00015	5.0%	–0.00081	26.3%
			Interactions	0.00100	–32.3%	–0.00100	32.3%	Disadvantage	–0.00118	38.2%	–0.00141	45.6%	–0.00049	15.7%
	AC	–0.00071	Characteristics	0.00028	–40.0%	0.00026	–36.3%	Productivity	0.00027	–37.3%	0.00026	–36.9%	0.00024	–33.7%
			Coefficients	–0.00097	136.3%	–0.00099	140.0%	Advantage	–0.00040	56.2%	–0.00028	39.6%	–0.00059	83.8%
			Interactions	–0.00003	3.7%	0.00003	–3.7%	Disadvantage	–0.00058	81.2%	–0.00069	97.4%	–0.00035	49.9%

Source: authors' calculations on WHIP data.

Table 13.8 Gender gap decomposition before and after Treu Package

Group	Type of contract	Raw Differential		$\Omega = 1$		$\Omega = 0$			$\Omega = 0.5$		$\Omega = sI$		$\Omega = wgt$	
		hM – hF		*Coeff.*	%	*Coeff.*	%		*Coeff.*	%	*Coeff.*	%	*Coeff.*	%
Pre-reform	PC	–0.00366	Characteristics	–0.00451	123.4%	–0.00266	72.7%	Productivity	–0.00356	97.3%	–0.00331	90.5%	–0.00359	98.1%
			Coefficients	–0.00100	27.3%	0.00086	–23.4%	Advantage	0.00073	–20.0%	0.00059	–16.2%	–0.00002	0.7%
			Interactions	0.00185	–50.7%	–0.00185	50.7%	Disadvantage	–0.00083	22.7%	–0.00094	25.8%	–0.00004	1.2%
	AC	0.00235	Characteristics	0.00124	52.7%	0.00162	68.8%	Productivity	0.00142	60.4%	0.00147	62.6%	0.00155	65.9%
			Coefficients	0.00073	31.2%	0.00111	47.3%	Advantage	0.00063	26.7%	0.00047	20.1%	0.00029	12.4%
			Interactions	0.00038	16.1%	–0.00038	–16.1%	Disadvantage	0.00030	12.9%	0.00041	17.3%	0.00051	21.7%
Post-reform	PC	0.00293	Characteristics	–0.00228	–77.8%	–0.00055	–18.7%	Productivity	–0.00146	–49.9%	–0.00131	–44.6%	–0.00061	–20.7%
			Coefficients	0.00348	118.7%	0.00521	177.8%	Advantage	0.00285	97.3%	0.00239	81.4%	0.00146	49.7%
			Interactions	0.00173	59.1%	–0.00173	–59.1%	Disadvantage	0.00154	52.6%	0.00185	63.2%	0.00208	70.9%
	AC	0.00117	Characteristics	0.00109	93.2%	0.00132	112.4%	Productivity	0.00121	102.7%	0.00123	104.3%	0.00117	100.0%
			Coefficients	–0.00015	–12.4%	0.00008	6.8%	Advantage	0.00010	8.6%	0.00009	7.9%	0.00000	0.0%
			Interactions	0.00023	19.2%	–0.00023	–19.2%	Disadvantage	–0.00013	–11.3%	–0.00014	–12.2%	0.00000	0.0%

Source: authors' calculations on WHIP data.

involves discrimination against low educated/skilled women. Women, especially if poorly educated, are indeed frequently segregated in occupations characterized by lower career prospects and therefore associated with atypical job contracts (Bettio and Verashchagina 2008). Poorly educated women, therefore, might suffer more from discrimination and occupational segregation (Triventi 2010).

The gender gap also varies between geographical areas. A territorial divide is indeed a structural feature of the Italian labour market (Bertola and Garibaldi 2003; and Ricciardi 1991). Table 13.5 reports the gender decomposition of the hazard rate in the North (and Centre) of Italy and in the South.

The raw gender gap in the hazard rate is quite heterogeneous by geographical area and exit contract. The gap in the North (and Centre) of Italy is –0.00123 and +0.00214 for the exits to PC and AC, respectively. The corresponding figures in the South are +0.00856 and +0.00158. Females in the North do show higher productivity (and better individual characteristics) compared to males. Differences in productivity explain most of their advantage and therefore there seems to be an absence of discrimination. These findings relates to those for the gender gap (Table 13.4), i.e. women selected into PC seem therefore more qualified than those not selected and advantaged when living in the North (and Centre) of Italy. In terms of AC opportunities, males have higher chances and this is explained (almost) completely by their characteristics/endowments. There is no discrimination of women (low advantage and disadvantage terms).

A quite different picture emerges in the South: men are favoured for both contract types, especially for PC. Interestingly, the productivity component is equal only to around 30 per cent for PC. This suggest the presence of discrimination for women living in the South in terms of opportunities to obtain permanent employment. The discrimination is lower, but still exists, for atypical employment. Slightly more than a half of the gap is explained by differences in productivity. The weakness of women living in the South is likely due also to the weak demand characterizing the labour market in the South of Italy/weakness of the South.

We also offer a breakdown by age since the overall age range examined, from 15 to 34 years, might confound different behaviours/characteristics between the very young (from 15 to 24), and the rest of the sample (from 25 to 34). Table 13.6 reports the decomposition analysis by gender for the young aged between 15 and 24.[17] The gender gap in re-employment probabilities is –0.00152 and 0.00161 for PC and AC, respectively. Females do show higher opportunities for permanent employment than males, and this is particularly due to their individual characteristics (–0.00328) or, in other words, to their productivity (–0.00248). The latter component is very important and equal to around 160 per cent. This suggest the absence of disadvantage/discrimination for very young women in terms of PC opportunities.

As for the atypical contracts, men are favoured, and productivity explains around 67 per cent. The remaining 33 per cent is due to discrimination-related terms.

The breakdown by age, therefore, shows that very young and hence poorly educated females (most of them are still involved in education) are not disadvantaged/discriminated in terms of permanent employment opportunities, whilst young males are more likely to be confined to atypical contracts. This reinforces the findings for the decomposition by gender, since females selected into employment (especially PC) are not only the more educated but, more in general, those with better individual characteristics.

The decomposition of the gender gap in re-employment probabilities by occupational qualification (Table 13.7) helps us understand the most relevant components which determine a higher presence of males in blue-collar occupations and the higher presence of females in white-collar occupations. This is a structural characteristic of the Italian employment and is confirmed by our data (descriptive statistics in Table 13.1) for the period 1985–2004.

As for blue-collar jobs, the advantage of males is higher for PC than AC (raw hazard rates of 0.00388 and 0.00130, respectively). For PC, the component for productivity do not exert a relevant role in this gap (around 10 per cent), whereas most of the gap (around 60 per cent) is explained by the term disadvantage. This latter suggests that males are more likely to be involved in blue-collar occupations since those jobs more better adapt to their attitudes. On the other hand, this prevents the access of women (lower group) to those kind of occupations. For atypical contracts, however, productivity is the most relevant component of the gap (around 66 per cent) and hence the components related to disadvantaged/unfair are less relevant.

Symmetrically, for white-collar workers, the advantage/more favourable condition of females is higher for PC than AC (–0.00310 and –0.00071, respectively). Whilst the gap in re-employment probabilities with permanent contracts is primarily explained by individual characteristics/productivity (more than 57 per cent), the gap for AC opportunities is mainly driven/determined by the term advantage (around 84 per cent). Women working in white-collar occupations are more positively selected in permanent employment, that is, women with higher qualifications/better individual characteristics are employed with permanent contracts. On the other hand, women tend to be confined in white-collar atypical employment contracts since these allow them to reconcile work and family duties. Finally, we have decomposed the gender gap in re-employment probabilities before and after the introduction of the Treu Package. This was to assess the impact of this legislative intervention on the composition of the gender gap in re-employment opportunities.[18]

Before the Treu Package, as shown in Table 13.8, the hazard rate towards PC is higher for females (–0.00366) and this is explained almost entirely by their productivity/individual characteristics (more than 98 per cent). The reverse is true for the re-employment opportunities with atypical contracts, that is, the hazard of males is higher (+0.00235). The picture changes after the Treu Package. In general, both the hazards to PC and AC are higher for males than females. Interestingly, the gender gap in re-employment with PC is primarily explained by discrimination (advantage and disadvantages terms), whereas the individual characteristics/productivity of females reduce this gap. As for re-employment via AC, the overall gap is explained by productivity/individual characteristics and the discrimination is null. To sum up, the Treu Package changes the relevance of the component related to the discrimination in the gender gaps in re-employment probabilities for both the contractual types. There is an increase of this component for re-employment with PCs, whilst the discrimination impact is reduced to zero for ACs. This is likely due to the increase of the types and the greater range of applicability of atypical contractual forms due to the package. This might indeed imply a higher selection into PCs, so that a PC is only for highly qualified individuals, and therefore higher presence of discrimination, and conversely the absence of selection/discrimination for ACs.

Conclusions

This study analyses the gender gap in re-employment probabilities of young Italian people aged 15–34, using the 1985–2004 WHIP data. We estimate the hazard rates of young people by exit contract type (permanent and atypical contracts) using logistic models. In addition, we apply a decomposition analysis with the aim of investigating the sources of the raw differentials, distinguishing the role of characteristics and their remuneration.

Our results indicate that females have lower raw re-employment probabilities than males, with few exceptions, including white-collars workers. Females living in the South experience the greatest raw differential (40–50 per cent) with respect to males, whether leaving non-employment via permanent or atypical contracts.

A decomposition analysis has been carried out both for the overall hazard and, for each gender, by working area, age, occupational, and before and after institutional changes. Our results indicate that the disadvantage of females for exits to PC is explained by lower returns, while productive characteristics potentially favour higher re-employment probabilities of females. This suggests that women with better work characteristics are highly selected into the labour market and indicates the presence of discrimination against females in terms of re-employment perspectives with permanent contracts. Conversely, the lower re-employment probabilities with AC of females seem to be explained essentially by different characteristics/productivity.

When analysing specific subgroups, and particularly for transitions to PC, emerging evidence confirms that females present characteristics potentially associated with higher hazard rates but, at the same, lower returns, resulting in discrimination. White-collar females, for whom both characteristics and returns contribute to explain higher hazard rates than for males, are the only exception.

Finally, most has changed with the introduction of the Treu Package. With regard to the re-employment probabilities by PC, the higher hazard rate for females has become a lower one. This has been both for a reduction of the advantage because of better work characteristics and a change in the returns, for which females were favoured in the pre-reform period and discriminated against since the reform. Conversely, the component due to discrimination is reduced to zero for probability of re-employment via AC.

In sum, even if with some exception, our results suggest that gender gap is a multifaceted issue. Evidence of wage discrimination, observed in the existing literature, is now accompanied by evidence of discrimination against young females in terms of re-employment probabilities. This seems particularly serious as early experiences in the labour market may produce relevant effects for later outcomes.

Notes

1 Disadvantaged workers are defined by Commission Regulation (EC) No. 2204/2002 as 'any person who belongs to a category which has difficulty entering the labour market without assistance'. This definition includes: young people, women living in depressed areas, disabled people, migrants and ethnic minorities, long-term unemployed, low-skilled workers, unemployed people over 50, single parents, the formerly convicted, and substance abusers (see Malo and Sciulli 2014).

2 Given that the aim of the analysis is to estimate re-employment probabilities of young people, we do not include first-time job seekers in our sample. This must be kept in mind when interpreting our results. Young people with previous work experience, indeed, are slightly older and with a higher knowledge of the functioning of the labour market compared to first-time job seekers.

3 As will be explained in due course, the techniques of decomposition adopted allow us also to calculate the components of the gender gap in favour (advantage) of the high group computed with respect to the non-discriminatory hazard; finally, disadvantage identifies the gap against the low group computed with respect to the non-discriminatory hazard, and this is a measure of discrimination.

4 The characteristics of our data (i.e. interval-censored data) allow us to estimate discrete-time hazard models (Prentice and Gloecker 1978).

5 Specifically, a binary dependent variable was created. If individual *i*'s survival time is censored then the dependent binary variable always takes value zero. If individual *i*'s survival time is not censored, the dependent binary variable is zero in the first $j - 1$ observations and one in the last observation.

6 We divided the total spell of non-employment into nine sub-spells for these groups of 1–3, 4–6, 7–9, 10–12, 13–18 (base category), 19–24, 25–36, 37–48, and over 48 months.

7 We use the nldecompose command in Stata.

8 WHIP data do not present attrition problems, since if workers or firms are enrolled with INPS, they must provide INPS with all the information. In addition, as stated in the relevant literature/empirical evidence based on the WHIP data (Contini and Grand 2010; Grand and Quaranta 2011: Contini and Poggi 2012), and by the specific documentation on those data (LABORatorio Revelli, 2009), the residual attrition that we observe is the product of perfectly explainable patterns of workforce utilization that have nothing to do with data collection.

9 When constructing our subsample, if an individual was simultaneously in more than one work relationship we eliminated the shorter one; if they were of the same duration, we removed the part-time job or the work relationship characterized by fewer days of actual work. Finally, when the second job started before the end of the first job but ended after it, we censored the second work spell to the left, and hypothesized that the second job started only when the first ended. In this way, the passage from a double job to a single one is seen as a transition from one job to another. This strategy is adopted to reconstruct the non-employment duration spells with accuracy.

10 We control for individual characteristics, characteristics of the previous job and for the business-cycle effect. We do not control, hiowever, for household variables – household composition/type and/or presence of child as suggested by the theoretical models referring to the household allocation of time (e.g., Becker 1985; Gronau 1977), since such information is not available in our dataset. The impacts of those variables are therefore confined into the unexplained component and/or component due to the unobserved heterogeneity.

11 The classification of the sectors of economic activity is the ATECO 91 adopted by the Italian National Institute of Statistics (ISTAT).

12 Employment growth is measured at macro-regional level with respect to the next quarter employment level using data from the 'Rilevazione sulle Forze di Lavoro' gathered by ISTAT.

13 The elimination of the self-employed implied a reduction of about 2 per cent of sampled individuals. Therefore, this does not particularly affect the estimation results.
14 A fixed-term contract of employment is defined as a contract of employment that has a definite start and end date, terminates automatically when a particular task is completed, or terminates after a specific event (other than retirement or summary dismissal). Legislative Decree no. 368/2001 liberalized the use of fixed-term contracts to allow firms to use them to adapt quickly to changes in economic conditions.
15 For the sake of brevity, we omit odds ratios related to the duration dependence variables.
16 We rely on a standard logit specification because decomposition is not allowed for models accounting for unobserved heterogeneity. In any case, results emerging from a model taking into account unobserved factors just differ, sometimes, in magnitude, but hold in terms of statistical significance and sign, leaving the essence of our findings unchanged.
17 We do not report the breakdown by gender for the age range 25–34 for the sake of brevity. Results are available upon request.
18 As mentioned in the introduction, the period examined was characterized by other relevant institutional changes, economic facts and variations in workforce composition. However, the Treu Package substantially increased flexibility by introducing temporary agency contracts, the regulation of *contratti di collaborazione*, the liberalization of on-the-job training contracts and certain innovations regarding fixed-term contracts. For details, see Mussida and Sciulli (2015).

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14 The regional impact of the crisis on young people in different EU countries

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Introduction

The 2007–8 financial crisis, the consequent Great Recession (2008–9), the euro-zone sovereign debt crisis (2010–14) and the ensuing austerity measures have had a deep impact – not always immediate, in some cases delayed but enduring – on European labour markets. The segment of the labour market most exposed to the impact of the crisis are young people. Nonetheless, there are significant differences between countries and even between regions within countries. In this chapter, we focus on developments within the European Union (EU) and we consider the Nuts-1 regional breakdown, especially focusing – in the econometric results – on the differences between male and female.

Also in the case of investigations of labour markets, the regional level is particularly important not only from an empirical analysis perspective, but also from a policy standpoint – just recall the EU's cohesion objectives. However, regional (subnational) investigations of the labour market impact of the recent crisis have been rare so far.[1] This contribution tries to fill this gap. A second original contribution of this chapter is that the analysis is based not only on the traditional indicators – youth unemployment rates (YURs) – but also on the more innovative NEET indicator.[2]

The econometric panel estimations are based on models (i) incorporating dynamic feedback to capture the persistence in the dependent variables, (ii) accommodating latent heterogeneity at different levels of regional aggregation, and (iii) allowing the crisis years to exert a separate impact on the dependent variable, both through the inclusion of time indicators and in interactions with the GDP growth rates. So, estimation is primarily based on the generalized method of moments (GMM) and bias-corrected fixed effect dynamic panel data estimators.

We begin with a brief review of the literature on NEET and youth unemployment, focusing on the most recent studies after the global crisis. We then present a description of the dynamics of both labour market indicators, by distinguishing the period before the crisis (2000–8) from the subsequent period (2009–11). Next we carry out our econometric analysis. A concluding section discusses key policy implications.

NEET and youth unemployment: a review of the literature

The YUR is, in most countries, twice or three times as high as the total unemployment rate (UR), and this was also the case before the crisis (Bruno *et al*. 2014a; Brada *et al*. 2014). The NEET group – young people not in employment, education or training – is even a greater problem for society since it leads to the risk of a 'lost generation'. Many authors argue that the size of the group of 'youth left behind' can be better proxied by the NEET indicator than by YUR (O'Higgins 2011; Scarpetta *et al*. 2010).

International institutions have also recognized the importance of the NEET indicator, initially adopted to study the problems of young workers in the United Kingdom. The 'Youth on the Move' initiative within the Europe 2020 programme of the EU (European Commission 2010) emphasizes the importance of focusing on the NEET problem. It has since become a key statistical indicator, now collected also by Eurostat. For a recent investigation on the key characteristics of NEETs in Europe, their institutional and structural determinants, their distribution across EU countries, the consequences (economic and social costs), and suggested policies, see the study by the European Foundation for the Improvement of Living and Working Conditions (Eurofund 2012).

Both UR and YUR have increased in many countries since the global financial crisis (2007–), the Great Recession (2008–9) and – more recently in the EU – the sovereign debt crisis and new recession (2012–14).

As far as the impact of the crisis on the young people is concerned, most of the evidence confirms a deeper impact compared to adult unemployment rates; moreover, YURs are usually more sensitive to the business cycle than adult unemployment rates. The main reasons can be found in the lower qualifications, less experience and weaker work contracts.[3] In the case of severe recessions, hardships for young people in both acquiring a job as a new entrant and remaining employed are enhanced. In addition, it should be noted that, being discouraged by high YUR, many young people give up job searching altogether;[4] in some cases, they decide to postpone job searching and stay in the education system, but in other cases the outcome is even worse, since they join the NEET group.

In addition to the greater immediate impact of the crisis[5] on YUR than on adult unemployment rates, further evidence concerns the persistence of unemployment over time and the increasing share of long-term unemployment. In fact, long periods of unemployment erode the skills of young workers, reduce their employability, cause a permanent loss of human capital and make unemployment persistent. Young people with low human capital and few skills are particularly exposed to long-term unemployment, unstable and low-quality jobs, and perhaps social exclusion (OECD 2005).[6]

O'Higgins (2011, 2012) warns that the key problem is not only that young people are more vulnerable to the effects of a crisis than older adults but also that these effects are likely to last longer for the young. But even before the crisis, persistence in NEET rates was a common result in empirical studies, at least for countries in southern Europe (Quintini *et al*. 2007). Since the existence of a 'youth experience gap' harms the employability of young people, appropriate institutions for the education system and school-to-work transition processes are of utmost importance (Caroleo and Pastore 2007).[7]

We conclude that studies on NEETs and YUR, following a comparative approach for all (or most) EU countries, are rare; even scarcer are investigations at the regional level.[8] However, there are more specific investigations devoted to 'case studies'[9] or comparisons between few regions or countries. For example, the Moving Project (2010) compares the situation in three EU regions: Merseyside (UK), Calabria (Italy) and Andalusia (Spain).[10]

Before ending this section it is appropriate to mention the most recent policies to tackle youth unemployment in the European context. Within the comprehensive package of EU policy initiatives called 'Youth on the Move' (European Commission 2010), the new 'Youth Opportunity Initiative' is designed to prevent early school leaving, help youngsters develop skills relevant to the labour market, assist young people in finding a first good job and ensure on-the-job training. The specific actions financed directly by the EU include: youth guarantee schemes, apprenticeship and traineeship programmes, support schemes for young business starters and social entrepreneurs, volunteering opportunities, and continuous support for the Erasmus and Leonardo da Vinci programs (see Eurofund 2012).

In particular, the 'Youth Guarantee Recommendation' agreed by the EU Council of Employment and Social Affairs Ministers in February 2013 requires that member states should put in place measures to ensure that young people up to age 25 receive a good-quality offer of employment, continued education, an apprenticeship or a traineeship within four months of leaving school or becoming unemployed.[11]

Recent evolution of NEET and youth unemployment in EU regions

In the last decade, higher than average YURs have occurred in different groups of countries: many Mediterranean countries (Spain, Italy, Greece), in addition to France and Belgium; some Scandinavian countries; and many new member states (NMS) of the EU.

As for the NEET rates, Eurofund (2012) reports that, in 2011, on average 12.9 per cent of young people (aged 15–24) were not in employment, education or training in the EU. Bulgaria, Ireland, Italy and Spain have very high NEET rates (greater than 17 per cent); high rates are also found in the UK; average rates in France, Portugal and some eastern countries; low rates in Germany, Sweden and Finland; and the lowest (less than 7 per cent) in the Netherlands and Luxembourg.

We now present some calculations making use of Eurostat data on EU regions. We have considered the Nuts-1 level regions; for the EU-27 countries there are a total of 97 of these (there are 7 countries where the Nuts-1 region corresponds to the country itself). The NEET rate is defined as 'young people aged 18–24 not in employment and not in any education and training' (as a percentage of the corresponding population). The unemployment rate (UR) refers to population 15 years old or over; the youth unemployment rate (YUR) to the 15–24 age class.

Table 14.1 Mean values for regional groups (m) and number of regions (*n*)

rgroup		*Year*	*NEET rate T*	*NEET rate M*	*NEET rate F*	*YUR T*	*YUR M*	*YUR F*	*UR T*	*UR M*	*UR F*
1	m	2000	11.83	11.04	13.66	12.81	12.67	13.00	8.68	7.95	9.53
	n		*29*	*25*	*28*	*35*	*35*	*35*	*35*	*35*	*35*
	m	2008	11.73	10.74	12.53	14.68	14.75	14.63	7.97	7.84	7.77
	n		*32*	*25*	*25*	*36*	*36*	*36*	*36*	*36*	*35*
	m	2011	11.90	11.49	12.85	14.97	14.88	15.11	7.69	7.79	7.17
	n		*31*	*23*	*24*	*37*	*37*	*37*	*37*	*37*	*36*
2	m	2000	9.35	9.10	9.65	13.14	14.04	12.28	6.64	6.78	6.46
	n		*2*	*2*	*2*	*5*	*5*	*5*	*5*	*5*	*5*
	m	2008	9.78	9.34	10.24	16.98	16.76	17.24	5.72	5.44	6.06
	n		*5*	*5*	*5*	*5*	*5*	*5*	*5*	*5*	*5*
	m	2011	10.26	10.42	10.08	20.86	22.10	19.56	7.68	7.90	7.42
	n		*5*	*5*	*5*	*5*	*5*	*5*	*5*	*5*	*5*
3	m	2000	14.28	10.71	17.86	12.14	13.60	10.47	5.77	6.42	5.01
	n		*12*	*11*	*12*	*13*	*13*	*13*	*13*	*13*	*13*
	m	2008	15.67	13.12	18.33	14.75	16.83	12.35	5.70	6.31	4.95
	n		*13*	*13*	*13*	*13*	*13*	*13*	*13*	*13*	*13*
	m	2011	19.06	17.70	20.47	21.87	24.64	18.67	8.63	9.58	7.52
	n		*13*	*13*	*13*	*13*	*13*	*13*	*13*	*13*	*13*
4	m	2000	18.59	14.81	22.28	24.20	19.05	30.87	11.02	7.75	16.26
	n		*19*	*19*	*19*	*19*	*19*	*19*	*19*	*19*	*19*
	m	2008	16.55	14.84	18.78	21.34	18.75	25.07	8.85	7.26	11.18
	n		*19*	*18*	*19*	*19*	*19*	*19*	*19*	*19*	*19*
	m	2011	22.63	22.22	23.04	38.26	36.54	40.58	15.98	15.08	17.31
	n		*19*	*19*	*19*	*19*	*19*	*19*	*19*	*19*	*19*
5	m	2000**	20.93	19.47	22.41	25.48	26.99	25.00	12.31	11.97	12.55
	n		*12*	*12*	*12*	*21*	*21*	*21*	*21*	*21*	*21*
	m	2008	13.51	11.32	15.77	16.09	15.87	16.89	6.62	6.59	6.81
	n		*21*	*21*	*21*	*21*	*21*	*21*	*21*	*21*	*21*
	m	2011	17.78	17.15	18.45	25.23	25.84	25.66	10.24	10.41	10.09
	n		*21*	*21*	*21*	*21*	*21*	*21*	*21*	*21*	*21*

** 2001 for NEET

Data for the above-mentioned labour market indices are generally available from 2000 to 2011. However, since there are some missing values, the precise number of regions for each variable is specified in Table 14.1.

In order to present some statistics concerning the key labour market indices, we have chosen to cluster the regions into supra-national groups (which will also be used in the econometric estimations), because studies on similar indicators presented at the national level are more frequent; such groups mainly differ because of dissimilar labour market institutions. In fact, most of the empirical evidence shows that labour market institutions – in addition to specific macroeconomic conditions and structural determinants – are a key determinant of the dynamics of unemployment (and NEET rates) over time, in particular of the differing impact of the crisis.[12]

Thus we have chosen five groups that are characterized by specific features concerning labour market institutions and the economic setting as a whole (including educational and welfare systems):

1. Continental regions: high productive industries and dual educational system;
2. Northern (Scandinavian) regions: extensive active labour market policies and flexicurity model;
3. Anglo-Saxon regions: high quality of education and labour market flexibility;
4. Southern regions: role of the family and diffusion of temporary works;
5. NMS regions: catching up and trying to build a modern welfare system.

This classification is used by Caroleo and Pastore (2007), although their analysis is at the country – not regional – level.[13] The authors themselves recognize that it largely overlaps with that constructed by Esping-Andersen (1990) for old member states. We add that in the NMS we have included all countries that joined the EU in 2004 and 2007, except for Cyprus and Malta (which have been added to the Southern regional group).[14]

Table 14.1 presents, for the five regional groups, the mean values of NEET rates, YUR and UR; for all variables, in addition to total figures, we provide separate figures for each gender.

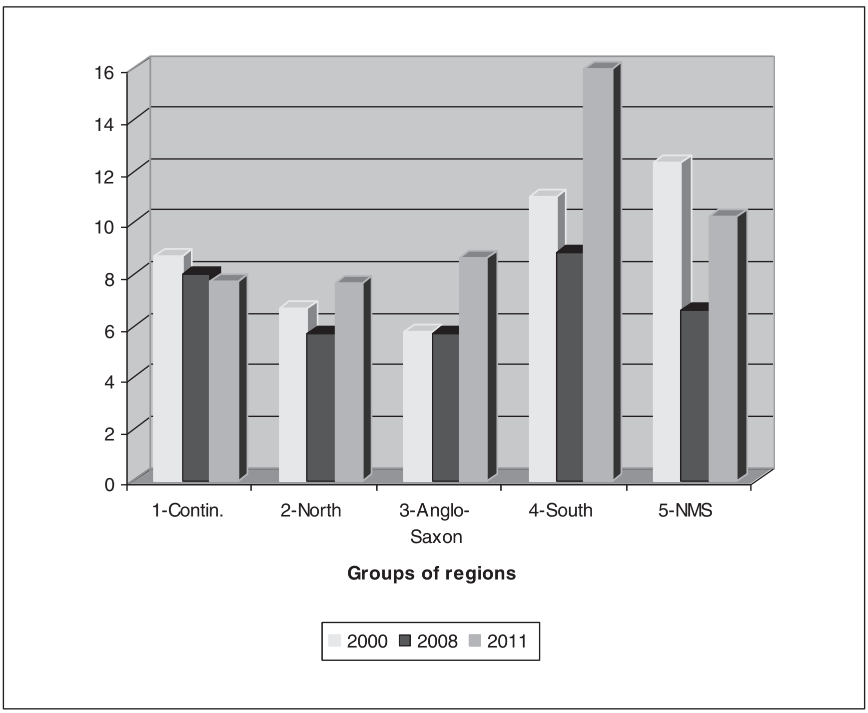

Figure 14.1 Unemployment rate, males and females, by region group

We now present the previous labour market indices in graphical form, in order to focus on the key changes over the crisis. We have chosen 2008 as the last year before the crisis, because this was the dominant situation in the EU (although in some regional groups the situation began to deteriorate in 2008 even in labour markets).

Total UR (Figure 14.1) is lower in Continental, Northern and Anglo-Saxon regions, compared to the two remaining groups. However, it decreased slightly after the crisis in Continental regions. The increase in Northern regions has been small; it has been more significant in Anglo-Saxon regions and NMS. In Southern regions it has doubled.

Thus labour market institutions seem to play a crucial role (of course in addition to further variables here not considered, such as structural conditions). Either cooperative/corporatist or flexicurity models seem superior – from the point of view of unemployment performance – to the complete flexibility of Anglo-Saxon countries or to the traditional systems of Southern countries.

The gap between the first two groups of regions and the remaining three is even wider in the case of YUR (Figure 14.2). Here the ranking of the worst-performing regions places the Southern regions in first place, the NMS second and the Anglo-Saxon regions third. In all three groups there has been a significant increase of YUR after the crisis; but also in Northern regions there has been a rise.

Thus, besides labour market institutions, it seems that the educational systems and school-to-work processes also play a relevant role. In particular, the 'dual' education system of Germany and Continental Europe appears the best way to minimize unemployment among young people.

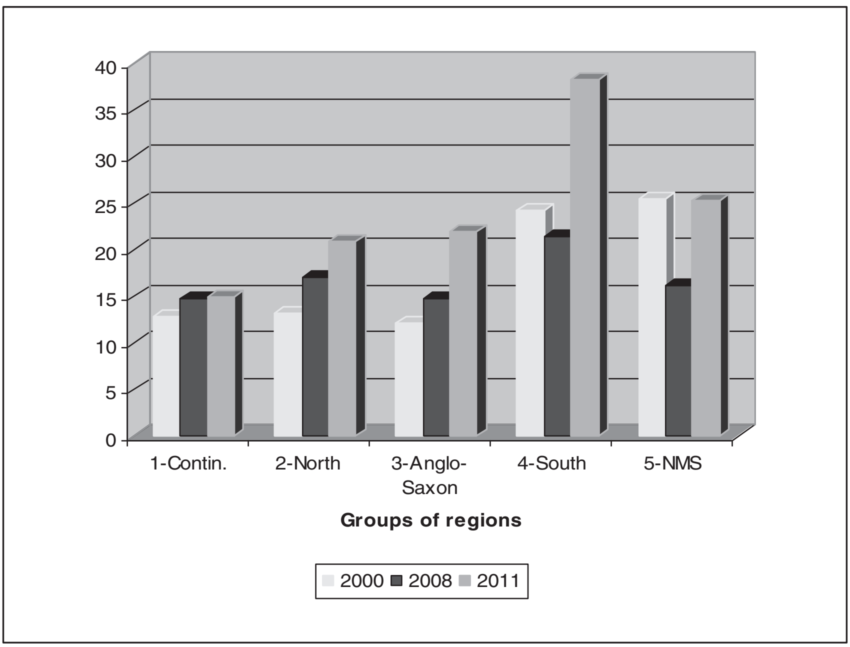

Figure 14.2 Youth unemployment rate, males and females, by region group

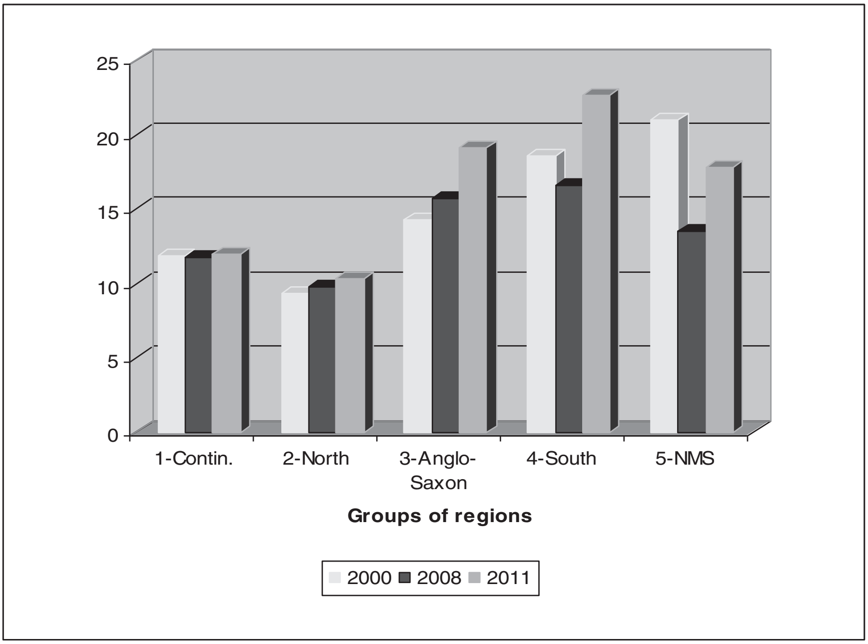

Figure 14.3 NEET rate, males and females, by region group

In the case of NEET rates (Figure 14.3) the picture is quite similar to that concerning YUR. However, it is interesting to note that the performance of Anglo-Saxon countries is relatively worse compared to NMS; the best performance is recorded by Northern countries, while for YUR Continental regions performed better. Of course, the worst NEET rate is still found in Southern regions.

The econometric analysis

We consider the following baseline model for NEET, YUR and UR rates broken down by gender:

$$y_{i,t} = \gamma y_{i,t-1} + \beta_0 x_{i,t} + \beta_1 x_{i,t-1} + c_t \left(\gamma_c y_{i,t-1} + \beta_{0c} x_{i,t} + \beta_{1c} x_{i,t-1}\right) + u_{it},$$
$$i = 1,\dots,N,\ t = 1,\dots,T, \tag{14.1}$$

Where

- $y_{i,t}$ is the male or female NEET rate (or, alternatively, male or female YUR and UR rates) of region *i* in year *t* and $x_{i,t}$ is a variable of economic activity at the regional level (e.g. regional GDP growth);
- c_t is a binary indicator that equals unity if *t* falls in the crisis period and zero otherwise;

- $u_{i,t} = \alpha_i + \eta_t + \lambda_{r(i),t} + \varepsilon_{i,t}$ is a composite error in which α_i indicates correlated latent regional effects, η_t are latent aggregate transitory shocks, $\lambda_{r(i),t}$ captures possibly time-varying effects at a macro-regional level, with $r(i)$ indicating the macro-region of region *i*, and $\varepsilon_{i,t}$ is a conventional idiosyncratic shock.

Equation (14.1) is suitably designed to identify the following effects of interest:

- the pre- and over-crisis persistence coefficients, γ and $\gamma + c_t\gamma_c$, respectively;
- the pre- and over-crisis two-year effects of $x_{i,t}$, $\beta_0 + \beta_1$ and $\beta_0 + \beta_1 + c_t\left(\beta_{0c} + \beta_{1c}\right)$, respectively.

Our estimation sample covers the period from 2000–10.[15] We focus on the crisis period 2009–10, in which all European countries had already entered recession (starting from 2008 produces less significant results, although signs and sizes of coefficient estimates remain largely the same).

Results for the pooled regressions

We use two popular dynamic panel data estimators: the two-step difference GMM (DIFF GMM; see Arellano and Bond 1991) and the two-step system GMM (SYS GMM; see Blundell and Bond 1998). Results are shown in Table 14.A1 and 14.A2 in the appendix to this chapter. Standard error estimates are corrected through the Windmeijer (2005) procedure. Almost always, GMM-type instruments start from the third lag of the dependent variable. The conventional tests (Hansen test, difference-in-Hansen test and Arellano–Bond AR tests) never reject the specification for all models considered.

To capture the η_t effects, all models include time dummies, which always turn out jointly significant. The regional effects α_i are accommodated through first differencing in the case of DIFF GMM and through both first differencing and a mean-stationarity assumption in the case of SYS GMM. Model 1 applies the constraints $\beta_{0c} = 0$, $\gamma_c = 0$ and does not consider the macro-region component. Model 2 is Model 1 without the first constraint. Model 3 is Model 2 without the $\gamma_c = 0$ constraint. Model 4 also incorporates the macro-region effects, but only time-constant, whilst Model 5 permits time-varying macro-region effects.

Our estimates consistently tell the following story:

1. NEET rates for both males and females are persistent and negatively respond to growth over the whole estimation period.
2. In the case of the male NEET rate, the crisis has a significant twofold impact. First, persistence of NEET rates over the crisis period seems higher than before. Second, the crisis effect of GDP growth is significantly lower for all NEET rates. Interestingly, before 2009 this effect is distributed over a two-year span, with a peak in the second year (the negative coefficient on *GDP growth(-1)*). From 2009, this pattern modifies and the lagged effect of growth is almost completely offset (the positive coefficient on *GDP growth(-1)*crisis*), making NEET rates considerably less sensitive to GDP. This finding may be explained by internal flexibility strategies adopted by the firms (including STWT) and by successful

labour market policies implemented by a number of regions in our sample in response to lower growth. The twofold impact of the crisis for the male NEET rate parallels what found in Bruno *et al* (2014b) for the total NEET rate.

3. For the female NEET rate the crisis effect on persistence loses significance and we are left only with the modified GDP growth effect discussed in the previous paragraph.
4. Overall, male NEET rates seem more responsive to GDP changes than female NEET rates. Such difference tends to be attenuated during the years of the crisis.

Results by groups of regions

It is likely that the results of Tables 14.A1–14.A2 are mostly driven by the largest group of regions in our estimation sample, Continental, dominated by German regions. To shed more light on the different patterns across the groups of regions we carry out dynamic panel data regressions by macro-regions (this exercise excludes the Northern group which has only six regions). Moreover, to get further insight into the crisis effects, we consider two increasingly general extensions of our previous specification: the first allows the threshold year, 2008, to exert a separate impact on NEET rates, the second goes a step further and also allows different effects for the crisis years, 2009 and 2010. Due to the reduced number of cross-sectional units in each macro-region, we carry out estimation through the LSDV estimator corrected for finite sample bias (LSDVC; see Kiviet 1995: Bruno 2005a, 2005b).

It is important to note that since the LSDVC estimator does not accommodate interactions involving $y_{i,t-1}$, all our LSDVC specifications set $\gamma_c = 0$ and as such do not nest the GMM Models 3–5. For this reason the two sets of models are difficult to compare each other.

Results are reported in Tables 14.A3–14.A4 for the first specification and Tables 14.A5–14.A6 for the second. In either case substantial heterogeneity between male and female NEET rates and across macro-regions emerge, with the following specific aspects:

1. NEET rates in Continental regions show unresponsiveness to GDP growth during the years of the crisis, especially in 2008 and 2009. This confirms that the stickiness over the crisis years found in the aggregate model is primarily due to the predominance of these regions in the estimation sample.
2. To the opposite, male NEET rates in the Anglo-Saxon group are extremely sensitive to GDP growth during the crisis period, but not before. Female NEET rates in this group, instead, are never significantly responsive to GDP growth.
3. NEET rates in the Southern group stand as the most persistent and unresponsive to GDP growth over the whole period considered for both males and females. Overall, such evidence suggests the existence of stronger structural weaknesses and hints lack of effective anti-cyclical interventions at regional and national levels in this group of regions.
4. NEET rates in the NMS regions are significantly sensitive to GDP growth over all estimation period and for both males and females, with no clear evidence of a crisis effect.

Results for YUR and UR

The peculiarities of the regional NEET rates can be better highlighted in comparison with the regional unemployment rates. To this end, we applied the most general specification to male and female YUR and UR. Results, reported in Tables 14.A7–14.A10, tend to suggest a picture that is broadly consistent with that found for the NEET rates in most of the aspects considered.

The successful implementation of anti-cyclical labour market policies in the Continental group emerges even more clearly for both male and female YUR and UR, with significantly lower responses to GDP changes over the crisis years. The opposite pattern peculiar to the Anglo-Saxon regions is also confirmed here, and in a more pronounced way. As a notable difference with the NEET estimates, we find that in the NMS regions, similarly to what happens in the Continental group on a broader level, the response of unemployment rates to GDP variation is significantly reduced in 2010.[16]

As found for the NEET rates, YUR and UR show the highest levels of persistence in the Southern regions, with even more force. Overall, total unemployment seems more persistent not only than youth unemployment, confirming what already found by Bruno *et al*. (2013) for a panel of OECD countries, but also than NEET rates. From an econometric point of view, we notice that the presence of unit roots both in the YUR and UR estimates does not affect the validity of our inference methods since: asymptotics apply for large N and fixed T; and the bias correction method is even more accurate in the presence of unit roots (Kiviet 1995). Remarkably, no relevant difference between the male and female regressions emerges in this case.

Conclusions

The main objective of this chapter was to investigate the dynamics of male and female youth unemployment rates (YUR) in comparison with both total unemployment rates and the NEET indicator. The main focus was on the changes occurred during the crisis (2009–11) with respect to the previous period.

The descriptive part of the chapter suggested distinguishing between five groups of countries (and regions). We have seen that the best performance, also over the crisis (2009–11), was recorded in Continental and Northern regions, while the worst changes can be found in Southern and NMS regions. Of course, the different institutions of labour markets, educational systems and school-to-work processes are relevant in explaining such different behaviour.

The econometric section intended to detect differences in persistence of NEET and YUR rates, and also possible changes (over the crisis) in the sensitivity of such indicators on GDP dynamics. We have used dynamic panel data GMM and bias-corrected LSDV estimators. The main results can be summarised as follows:

1. Male and female NEET rates are persistent over time to a degree comparable to YURs; furthermore, persistence increased over the crisis years (2009–10).
2. The highest persistence of male and female NEET rates, as well as YUR and UR, and the lowest response to GDP is found in Southern regions.

3. The sensitivity of NEET rates to GDP has decreased during the crisis. This result is especially influenced by the dynamics in Continental regions, whereas Anglo-Saxon regions are particularly sensitive to GDP during the crisis, especially for males, and NMS regions are also highly sensitive to GDP, but rather homogenously over the whole estimation period.
4. The foregoing patterns are largely replicated by the YUR estimates with the exception that for NMS regions YUR is not found sensitive to GDP in 2010. Results in this case are largely homogeneous between males and females.

In general terms, the econometric estimations highlight different statistically significant degrees of persistence of NEET rates or YUR and/or their sensitivity to GDP dynamics; a general key policy implication is that the worst-performing countries (and regions) need both structural (institutional, economic and labour) policies and counter-cyclical macroeconomic policies. An increase in GDP, after many years of stagnation (which has affected many EU countries and regions), would benefit the regions where sensitivity is particularly high; the impact would be smaller where unemployment has become persistent. This outcome is particularly dreadful for young people, who will bear the negative impact of the crisis for many years to come. However, the situation in the EU is differentiated – across countries and regions – because of the diverse labour market (and education) institutions.

In particular, two outcomes of our empirical analyses are worth stressing. The first result is that institutions and policies similar to those adopted in Continental Europe, especially in Germany, are especially apt to minimize the impact on labour markets (thanks to working hour adjustments, crisis management agreed with trade unions, targeted policies for young people, dual educational system, etc.). The second relevant result concerns the Southern regions: the high persistence of NEET and YUR – both male and female – and the low responsiveness to GDP mean that, even when the economy does recover, many years will elapse before the situation of young people improves, unless they rapidly adopt effective structural policies – for example, changing the characteristics of the educational systems and improving the joint effect of active and passive labour policies (see Dal Bianco *et al*. 2015).

Notes

1 For recent exceptions, see Marelli *et al*. (2012) and Bruno *et al*. (2014b).
2 The use of a Nuts-1 regional breakdown also makes it possible to use such data.
3 See Arpaia and Curci (2010), who produced a broad analysis of labour market adjustments in the EU-27 after the 2008–9 recession in terms of employment, unemployment, hours worked and wages.
4 According to ILO (2012), if the unemployment rate is adjusted for the dropout induced by the economic crisis, the global YUR in 2011 would rise from 12.6 per cent to 13.6 per cent.
5 The greater impact on YUR has been found in the specific case of financial crises, in an empirical analysis including a long period (starting 1980) and a large sample of countries in the world: see Choudhry *et al*. (2012).
6 However, more human capital and higher levels of education do not automatically translate into improved labour market outcomes and more jobs (ILO 2012).
7 It seems, for example, that youth labour performance is better in countries operating a ‘dual apprenticeship system’.

8 Very few studies exist on the investigation of regional youth unemployment (e.g. Demidova *et al*. 2013, 2015).
9 Many studies or reports of public agencies still refer to the UK regions, where the NEET analyses began.
10 It is also interesting to note that investigations on NEETs have become common even outside Europe: while Rosso *et al*. (2012) focus on the Mediterranean region, Liang (2009) provides interesting evidence for Japan.
11 The corresponding Youth Employment Initiative has a budget of €6 billion for the period 2014–20. It will complement to other projects undertaken at national level, including those with European Social Fund support.
12 OECD (2006) showed that almost two-thirds of non-cyclical unemployment changes are explained by changes in policies and institutions.
13 A different grouping of EU countries, into four clusters of countries (not necessarily contiguous from a geographical point of view) can be found in Eurofund (2012).
14 Furthermore, differently from Caroleo and Pastore, we have included France in the Continental group (instead of the Southern one) and Denmark in the Northern group (instead of the Continental one).
15 In fact GDP is not observed in 2011 at the regional level.
16 Notice that some Eastern countries with many regions, such as Poland, were hit only mildly by the Great Recession.

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Appendix – Estimation Tables

Table 14.A1 GMM estimates, male NEET rates

Variables	*(1)* *DIFF GMM*	*(2)* *DIFF GMM*	*(3)* *DIFF GMM*	*(4)* *SYS GMM*	*(5)* *SYS GMM*
neetratem(−1)	0.730***	0.727***	0.736***	0.700***	0.615***
	(0.0575)	(0.0671)	(0.0651)	(0.0663)	(0.103)
neetratem(−1)*crisis			0.131*	0.127**	0.0611
			(0.0776)	(0.0595)	(0.140)
GDP growth	−0.233***	−0.189***	−0.193**	−0.264***	−0.289***
	(0.0395)	(0.0696)	(0.0757)	(0.0766)	(0.0965)

(*Continued*)

Table 14.A1 (Continued)

Variables	*(1) DIFF GMM*	*(2) DIFF GMM*	*(3) DIFF GMM*	*(4) SYS GMM*	*(5) SYS GMM*
GDP growth (−1)	−0.502***	−0.503***	−0.608***	−0.531***	−0.726***
	(0.179)	(0.164)	(0.174)	(0.145)	(0.206)
GDP growth*crisis		−0.0718	−0.0580	0.0392	0.0488
		(0.0841)	(0.103)	(0.0982)	(0.113)
GDP growth(−1)*crisis	0.337*	0.365	0.491**	0.349*	0.598**
	(0.184)	(0.232)	(0.225)	(0.197)	(0.261)
Northern				1.260	4.067
				(2.049)	(3.550)
Anglo-Saxon				1.760**	1.063
				(0.743)	(0.848)
Southern				3.078**	4.400**
				(1.439)	(1.991)
NMS				4.463***	6.269***
				(0.774)	(1.583)
Continental*crisis					−2.417
					(1.543)
Northern*crisis					−6.494*
					(3.767)
Anglo-Saxon*crisis					−0.963
					(2.741)
Southern*crisis					−1.784
					(4.117)
NMS*crisis					−4.292*
					(2.317)
Constant				4.235***	5.132***
				(0.799)	(1.187)
Observations	591	591	591	681	681
Number of regions	86	86	86	87	87
GDP growth pre-crisis effect	−0.735***	−0.692***	−0.801***	−0.795***	−1.015***
GDP growth crisis effect	−0.398***	−0.398**	−0.368**	−0.407***	−0.368**
t-dummies *F*-test pvalue	0.010	0.004	0.004	0.002	0.002
Number of instruments	46	46	46	55	55
Hansen test pvalue	0.270	0.287	0.121	0.168	0.237
AR2 test pvalue	0.047	0.056	0.051	0.048	0.013
AR3 test pvalue	0.337	0.355	0.324	0.327	0.399
Crisis effect *t*-test		1.239	1.840*	2.537**	2.625***
Persistence during crisis			0.867***	0.827***	0.676***

Robust standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 14.A2 GMM estimates, female NEET rates

Variables	*(1)* *DIFF GMM*	*(2)* *DIFF GMM*	*(3)* *DIFF GMM*	*(4)* *SYS GMM*	*(5)* *SYS GMM*
neetratef(−1)	0.733***	0.681***	0.703***	0.832***	0.813***
	(0.0563)	(0.0601)	(0.0558)	(0.0474)	(0.0651)
neetratef(−1)*crisis			0.0628	0.0631	0.0764
			(0.0574)	(0.0489)	(0.0487)
GDP growth	−0.146***	−0.112**	−0.106**	−0.131***	−0.172***
	(0.0400)	(0.0471)	(0.0474)	(0.0493)	(0.0657)
GDP growth (−1)	−0.346***	−0.309***	−0.357***	−0.346***	−0.434***
	(0.0910)	(0.0979)	(0.0888)	(0.0940)	(0.117)
GDP growth*crisis		−0.0884	−0.0878	−0.0504	0.00361
		(0.0696)	(0.0692)	(0.0791)	(0.0915)
GDP growth(−1)*crisis	0.252***	0.141	0.218**	0.289***	0.413**
	(0.0848)	(0.108)	(0.103)	(0.108)	(0.166)
Northern				1.469	−0.677
				(2.159)	(3.208)
Anglo-Saxon				1.469**	2.788***
				(0.719)	(0.783)
Southern				1.228	1.855
				(0.882)	(1.177)
NMS				2.497***	3.623***
				(0.820)	(1.200)
Continental*crisis					−1.439
					(1.092)
Northern*crisis					−1.177
					(2.215)
Anglo-Saxon*crisis					−2.622**
					(1.197)
Southern*crisis					−2.517
					(1.585)
NMS*crisis					−2.685*
					(1.429)
Constant				2.608***	2.805***
				(0.751)	(1.015)
Observations	601	601	601	690	690
Number of regions	86	86	86	87	87
GDP growth pre-crisis effect	−0.492***	−0.421***	−0.463***	−0.477***	−0.606***
GDP growth crisis effect	−0.239***	−0.368***	−0.333***	−0.238**	−0.190*
t-dummies F-test pvalue	0.004	0.004	0.004	0.00239	0.00187
Number of instruments	46	46	46	55	64
Hansen test pvalue	0.397	0.382	0.391	0.347	0.642
AR2 test pvalue	0.439	0.356	0.388	0.554	0.691
AR3 test pvalue	0.506	0.527	0.548	0.575	0.564
Crisis effect t-test		0.412	1.158	2.565***	2.134**
Persistence during crisis			0.765***	0.896***	0.889***

Robust standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 14.A3 LSDVC estimates by macro-regions, male NEET rates

Variables	*Continental*	*Anglo-Saxon*	*Southern*	*NMS*
neetratem(−1)	0.570***	0.609***	0.890***	0.577***
	(0.0745)	(0.114)	(0.0794)	(0.0640)
GDP growth	−0.0533	0.120	0.139	−0.329***
	(0.103)	(0.336)	(0.129)	(0.0945)
GDP growth(−1)	−0.0963	−0.240	−0.113	−0.297***
	(0.123)	(0.329)	(0.131)	(0.102)
GDP growth*crisis	−0.118	−0.972*	−0.475**	−0.0289
	(0.169)	(0.579)	(0.236)	(0.116)
GDP growth(−1)*crisis	−0.0590	−0.392	0.259	0.123
	(0.192)	(0.570)	(0.318)	(0.129)
GDP growth*2008	0.0331	−2.186***	−1.064**	0.0616
	(0.186)	(0.722)	(0.539)	(0.166)
GDP growth(−1)*2008	0.334*	1.630**	1.200*	−0.00416
	(0.192)	(0.687)	(0.655)	(0.154)
Dummy 2003	0.421	−3.332***	0.661	−0.412
	(0.428)	(0.769)	(0.736)	(0.628)
Dummy 2004	0.537	−1.737**	−0.437	0.0961
	(0.487)	(0.743)	(0.779)	(0.659)
Dummy 2005	0.0945	−1.334*	0.349	−0.516
	(0.514)	(0.713)	(0.725)	(0.678)
Dummy 2006	−0.665	−1.541*	−1.394*	−1.158
	(0.524)	(0.798)	(0.787)	(0.718)
Dummy 2007	−0.927*	1.541*	−0.299	−2.456***
	(0.533)	(0.826)	(0.760)	(0.774)
Dummy 2008	−1.692***	−8.067**	−1.074	−3.333***
	(0.635)	(3.177)	(1.927)	(1.005)
Dummy 2009	0.646	−1.528	3.234***	−2.347**
	(0.723)	(1.809)	(1.187)	(0.970)
Dummy 2010	−0.818	0.140	2.325	−2.241**
	(0.696)	(3.042)	(1.852)	(0.941)
Observations	242	108	151	153
Number of regions	32	13	17	20
GDP growth pre-crisis effect	−0.150	−0.121	0.0258	−0.626***
GDP growth effect in 2008	0.217	−0.677	0.162	−0.569***
2008 effect t-test	1.451	−0.986	0.285	0.308
GDP growth crisis effect	−0.326	−1.485***	−0.190	−0.532***
Crisis effect t-test	−0.654	−2.366**	−0.561	0.610
t-dummies F-test pvalue	0.002	0.000	0.011	0.001

Bootstrapped standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 14.A4 LSDVC estimates by macro-regions, female NEET rates

Variables	*Continental*	*Anglo-Saxon*	*Southern*	*NMS*
Neetratef(−1)	0.471***	0.400***	0.811***	0.482***
	(0.0696)	(0.125)	(0.0811)	(0.0758)
GDP growth	−0.0556	−0.455	0.155	−0.0870
	(0.0960)	(0.373)	(0.116)	(0.0879)
GDP growth(−1)	−0.153	0.279	0.0432	−0.122
	(0.111)	(0.355)	(0.119)	(0.0981)
GDP growth*crisis	−0.141	0.843	−0.444**	−0.124
	(0.156)	(0.702)	(0.202)	(0.105)
GDP growth(−1)*crisis	0.130	−0.988*	0.0978	−0.0466
	(0.164)	(0.581)	(0.275)	(0.120)
GDP growth*2008	0.0582	1.000	−0.380	−0.0770
	(0.171)	(0.819)	(0.427)	(0.138)
GDP growth(−1)*2008	0.369**	−1.162	−0.176	−0.154
	(0.177)	(0.813)	(0.606)	(0.136)
Dummy 2003	0.0997	−4.207***	0.783	−0.926
	(0.401)	(0.895)	(0.703)	(0.578)
Dummy 2004	0.572	−4.335***	0.00704	−0.287
	(0.434)	(0.948)	(0.656)	(0.623)
Dummy 2005	0.904**	−3.607***	−0.169	−0.983
	(0.392)	(0.969)	(0.661)	(0.663)
Dummy 2006	−0.0273	−3.728***	−2.081***	−1.750**
	(0.485)	(1.003)	(0.684)	(0.688)
Dummy 2007	−0.470	2.098*	−0.465	−3.195***
	(0.488)	(1.071)	(0.739)	(0.784)
Dummy 2008	−1.715***	3.888	1.516	−2.328**
	(0.622)	(3.724)	(1.767)	(1.030)
Dummy 2009	−0.822	0.669	1.388	−3.095***
	(0.658)	(2.075)	(1.017)	(0.951)
Dummy 2010	−0.430	−1.968	1.978	−2.977***
	(0.624)	(3.602)	(1.389)	(0.983)
Observations	246	109	153	155
Number of regions	32	13	17	20
GDP growth pre-crisis effect	−0.209	−0.177	0.198	−0.209**
GDP growth effect in 2008	0.218	−0.339	−0.358	−0.440***
2008 effect t-test	1.814*	−0.276	−1.318	−1.389
GDP growth crisis effect	−0.219	−0.322	−0.148	−0.380***
Crisis effect t-test	−0.0458	−0.222	−1.069	−1.242
t-dummies F-test pvalue	0.000	0.000	0.000	0.000

Bootstrapped standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 14.A5 LSDVC estimates by macro-regions, with separate impacts of the crisis years, male NEET rates

Variables	*Continental*	*Anglo-Saxon*	*Southern*	*NMS*
neetratem(−1)	0.566***	0.593***	0.885***	0.593***
	(0.0752)	(0.119)	(0.0803)	(0.0626)
GDP growth	−0.0581	0.0770	0.143	−0.336***
	(0.105)	(0.345)	(0.131)	(0.0946)
GDP growth(−1)	−0.0756	−0.261	−0.104	−0.303***
	(0.125)	(0.343)	(0.132)	(0.102)
GDP growth*2008	0.0205	−2.176***	−1.037*	0.0192
	(0.190)	(0.735)	(0.549)	(0.172)
GDP growth(−1)*2008	0.293	1.604**	1.185*	0.00904
	(0.196)	(0.702)	(0.666)	(0.154)
GDP growth*2009	0.152	−1.780	−0.481	0.0635
	(0.239)	(1.343)	(0.513)	(0.123)
GDP growth(−1)*2009	−0.215	0.153	0.710	−0.0885
	(0.214)	(1.199)	(0.463)	(0.170)
GDP growth*2010	−0.330	−0.411	−0.619**	−0.0854
	(0.268)	(0.782)	(0.288)	(0.215)
GDP growth(−1)*2010	0.0254	−0.227	−0.342	0.209
	(0.284)	(0.689)	(0.480)	(0.138)
dummy 2003	0.442	−3.285***	0.664	−0.405
	(0.434)	(0.762)	(0.742)	(0.628)
dummy 2004	0.577	−1.764**	−0.435	0.115
	(0.493)	(0.757)	(0.785)	(0.658)
dummy 2005	0.0860	−1.408**	0.349	−0.474
	(0.520)	(0.716)	(0.730)	(0.679)
dummy 2006	−0.641	−1.618**	−1.394*	−1.095
	(0.531)	(0.796)	(0.792)	(0.715)
dummy 2007	−0.939*	1.501*	−0.316	−2.361***
	(0.540)	(0.827)	(0.767)	(0.772)
dummy 2008	−1.584**	−8.153**	−1.025	−3.191***
	(0.642)	(3.171)	(1.949)	(1.003)
dummy 2009	1.749*	−4.197	3.161	−1.048
	(0.958)	(2.967)	(2.331)	(1.112)
dummy 2010	0.117	−0.249	0.0180	−1.713
	(0.938)	(3.080)	(2.401)	(1.063)
Observations	242	108	151	153
Number of regions	32	13	17	20
GDP growth pre-crisis effect	−0.134	−0.184	0.0398	−0.639***
GDP growtheffect in 2008	0.180	−0.755	0.188	−0.611***
2008 effect t-test	1.217	−1.023	0.309	0.150
GDP growtheffect in 2009	−0.197	−1.811***	0.268	−0.664***
2009 effect t-test	−0.208	−2.674***	0.480	−0.141
GDP growtheffect in 2010	−0.438	−0.823	−0.921	−0.515***
2010 effect t-test	−0.662	−0.599	−1.569	0.573
t-dummies F-test pvalue	0.002	0.000	0.179	0.001

Bootstrapped standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 14.A6 LSDVC estimates by macro-regions, with separate impacts of the crisis years, female NEET rates

Variables	*Continental*	*Anglo-Saxon*	*Southern*	*NMS*
neetratef(−1)	0.456***	0.411***	0.814***	0.496***
	(0.0706)	(0.128)	(0.0825)	(0.0764)
GDP growth	−0.0552	−0.423	0.157	−0.0954
	(0.0964)	(0.394)	(0.119)	(0.0887)
GDP growth(−1)	−0.144	0.327	0.0447	−0.128
	(0.112)	(0.386)	(0.121)	(0.0993)
GDP growth*2008	0.0502	0.902	−0.395	−0.0794
	(0.172)	(0.853)	(0.435)	(0.141)
GDP growth(−1)*2008	0.343*	−1.073	−0.161	−0.149
	(0.179)	(0.836)	(0.614)	(0.138)
GDP growth*2009	0.0506	−0.147	−0.348	−0.0680
	(0.207)	(1.664)	(0.466)	(0.114)
GDP growth(−1)*2009	0.0926	−0.150	0.127	−0.128
	(0.178)	(1.454)	(0.387)	(0.154)
GDP growth*2010	−0.437*	0.880	−0.492**	−0.259
	(0.234)	(0.984)	(0.231)	(0.197)
GDP growth(−1)*2010	0.00208	−1.070*	−0.0865	0.00688
	(0.255)	(0.648)	(0.410)	(0.129)
dummy 2003	0.111	−4.216***	0.785	−0.905
	(0.401)	(0.908)	(0.710)	(0.585)
dummy 2004	0.589	−4.309***	0.00638	−0.235
	(0.436)	(0.961)	(0.664)	(0.627)
dummy 2005	0.909**	−3.509***	−0.168	−0.919
	(0.394)	(0.984)	(0.668)	(0.671)
dummy 2006	−0.00922	−3.614***	−2.080***	−1.664**
	(0.487)	(1.029)	(0.691)	(0.694)
dummy 2007	−0.478	2.183**	−0.459	−3.087***
	(0.491)	(1.083)	(0.746)	(0.790)
dummy 2008	−1.653***	3.552	1.493	−2.231**
	(0.626)	(3.792)	(1.784)	(1.040)
dummy 2009	−0.0998	−1.381	1.771	−2.447**
	(0.851)	(3.565)	(2.162)	(1.117)
dummy 2010	−0.153	−1.995	1.256	−2.428**
	(0.793)	(3.783)	(1.853)	(1.067)
Observations	246	109	153	155
Number of regions	32	13	17	20
GDP growth pre-crisis effect	−0.199	−0.0960	0.202	−0.224**
GDP growtheffect in 2008	0.195	−0.267	−0.354	−0.452***
2008 effect t-test	1.661*	−0.285	−1.306	−1.375
GDP growtheffect in 2009	−0.0555	−0.393	−0.0185	−0.420***
2009 effect t-test	0.568	−0.421	−0.544	−1.306
GDP growtheffect in 2010	−0.634	−0.286	−0.377	−0.476***
2010 effect t-test	−1.044	−0.167	−1.209	−1.238
t-dummies F-test pvalue	0.000	0.000	0.003	0.000

Bootstrapped standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 14.A7 LSDVC estimates by macro-regions, with separate impacts of the crisis years, male YUR

Variables	*Continental*	*Anglo-Saxon*	*Southern*	*NMS*
Yurm(−1)	0.264***	0.427***	1.000***	0.743***
	(0.0668)	(0.110)	(0.0577)	(0.0588)
GDP growth	−0.261*	−0.0942	−0.197	−0.400**
	(0.149)	(0.471)	(0.202)	(0.175)
GDP growth(−1)	−0.136	−0.748*	−0.168	−0.632***
	(0.168)	(0.444)	(0.204)	(0.177)
GDP growth*2008	0.296	−1.336	−0.932	0.0403
	(0.221)	(0.988)	(0.660)	(0.285)
GDP growth(−1)*2008	0.304	0.909	0.705	0.191
	(0.305)	(0.970)	(0.856)	(0.313)
GDP growth*2009	0.779***	−3.937**	−0.620	−0.217
	(0.256)	(1.890)	(0.728)	(0.249)
GDP growth(−1)*2009	0.0618	1.790	0.879	−0.0940
	(0.240)	(1.654)	(0.646)	(0.288)
GDP growth*2010	−0.0648	−1.276	−0.521	0.663
	(0.393)	(1.094)	(0.380)	(0.437)
GDP growth(−1)*2010	0.540*	−0.910	−0.375	0.353
	(0.299)	(0.882)	(0.602)	(0.264)
dummy 2003	0.651	−0.258	0.513	−1.569
	(0.690)	(1.060)	(1.182)	(1.205)
dummy 2004	2.190***	−1.375	0.0102	1.956
	(0.783)	(0.959)	(1.136)	(1.213)
dummy 2005	3.038***	1.237	−0.952	−0.922
	(0.752)	(0.877)	(1.128)	(1.281)
dummy 2006	2.157**	0.645	−0.991	−3.085**
	(0.886)	(0.940)	(1.184)	(1.258)
dummy 2007	0.207	0.381	−0.721	−3.719***
	(0.836)	(1.036)	(1.153)	(1.319)
dummy 2008	−1.352	−3.151	1.314	−4.566**
	(1.007)	(4.242)	(2.524)	(2.067)
dummy 2009	3.881***	−9.420**	3.813	0.401
	(1.118)	(3.950)	(3.212)	(2.136)
dummy 2010	2.740**	−1.755	0.543	−4.645**
	(1.146)	(4.241)	(2.779)	(1.924)
Observations	324	115	162	180
Number of regions	36	13	18	20
GDP growth pre-crisis effect	−0.397*	−0.842	−0.365	−1.032***
GDP growtheffect in 2008	0.204	−1.270	−0.592	−0.801**
2008 effect t-test	1.601	−0.561	−0.323	0.632
GDP growtheffect in 2009	0.444	−2.989***	−0.107	−1.343***
2009 effect t-test	2.317**	−2.568***	0.377	−0.922
GDP growtheffect in 2010	0.0780	−3.029***	−1.261*	−0.0162
2010 effect t-test	0.803	−1.525	−1.226	2.251**
t-dummies F-test pvalue	0.000	0.029	0.758	0.000

Bootstrapped standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 14.A8 LSDVC estimates by macro-regions, with separate impacts of the crisis years, female YUR

Variables	*Continental*	*Anglo−Saxon*	*Southern*	*NMS*
yurf(−1)	0.350***	0.365***	0.902***	0.742***
	(0.0638)	(0.105)	(0.0740)	(0.0607)
GDP growth	−0.0490	−0.280	−0.135	−0.441***
	(0.134)	(0.338)	(0.210)	(0.164)
GDP growth(−1)	−0.198	−0.589*	−0.299	−0.492***
	(0.150)	(0.317)	(0.209)	(0.166)
GDP growth*2008	0.125	0.373	0.367	0.119
	(0.199)	(0.710)	(0.678)	(0.267)
GDP growth(−1)*2008	0.546**	−0.339	−0.803	−0.0842
	(0.275)	(0.695)	(0.884)	(0.293)
GDP growth*2009	0.0698	−1.050	−0.546	0.0121
	(0.231)	(1.352)	(0.758)	(0.233)
GDP growth(−1)*2009	0.112	1.894	−0.0196	0.188
	(0.215)	(1.183)	(0.669)	(0.270)
GDP growth*2010	−0.334	−0.376	−0.627	0.442
	(0.355)	(0.792)	(0.389)	(0.413)
GDP growth(−1)*2010	0.537**	−0.258	0.353	0.272
	(0.265)	(0.580)	(0.630)	(0.245)
dummy 2003	−0.169	0.467	0.0580	0.0929
	(0.618)	(0.761)	(1.205)	(1.127)
dummy 2004	2.029***	0.370	−1.571	−0.180
	(0.687)	(0.679)	(1.163)	(1.130)
dummy 2005	3.448***	0.814	−0.849	−0.518
	(0.649)	(0.625)	(1.174)	(1.196)
dummy 2006	2.273***	1.040	−2.164*	−1.544
	(0.787)	(0.662)	(1.233)	(1.168)
dummy 2007	0.959	1.664**	−0.813	−4.516***
	(0.745)	(0.742)	(1.241)	(1.190)
dummy 2008	−1.089	2.520	2.412	−2.726
	(0.912)	(3.052)	(2.659)	(1.915)
dummy 2009	1.349	−0.492	2.135	−4.012**
	(1.008)	(2.792)	(3.336)	(1.975)
dummy 2010	3.243***	0.678	1.698	−2.684
	(0.988)	(3.113)	(2.852)	(1.790)
Observations	324	115	162	180
Number of regions	36	13	18	20
GDP growth pre-crisis effect	−0.247	−0.870**	−0.434	−0.933***
GDP growtheffect in 2008	0.424	−0.836	−0.870	−0.898***
2008 effect t-test	1.981**	0.0609	−0.598	0.102
GDP growtheffect in 2009	−0.0644	−0.0255	−0.999	−0.733***
2009 effect t-test	0.559	1.426	−0.792	0.634
GDP growtheffect in 2010	−0.0435	−1.504**	−0.708	−0.218
2010 effect t-test	0.382	−0.648	−0.362	1.677*
t-dummies F-test pvalue	0.000	0.521	0.434	0.001

Bootstrapped standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 14.A9 LSDVC estimates by macro-regions, with separate impacts of the crisis years, male total UR

Variables	*Continental*	*Anglo-Saxon*	*Southern*	*NMS*
turm(−1)	0.990***	0.719***	1.179***	0.803***
	(0.0468)	(0.109)	(0.0315)	(0.0527)
GDP growth	−0.0941*	−0.148	−0.128	−0.231***
	(0.0520)	(0.154)	(0.0781)	(0.0657)
GDP growth(−1)	−0.182***	−0.209	−0.0779	−0.300***
	(0.0581)	(0.148)	(0.0789)	(0.0670)
GDP growth*2008	0.113	−0.355	−0.242	0.0677
	(0.0763)	(0.323)	(0.256)	(0.108)
GDP growth(−1)*2008	0.224**	0.190	−0.0490	0.0132
	(0.105)	(0.317)	(0.333)	(0.118)
GDP growth*2009	0.124	−1.694***	−0.136	−0.133
	(0.0893)	(0.628)	(0.279)	(0.0933)
GDP growth(−1)*2009	0.104	1.258**	0.134	−0.0299
	(0.0830)	(0.547)	(0.247)	(0.108)
GDP growth*2010	−0.0144	−0.501	−0.221	0.394**
	(0.139)	(0.373)	(0.147)	(0.164)
GDP growth(−1)*2010	0.262***	−0.298	−0.166	0.172*
	(0.101)	(0.295)	(0.228)	(0.102)
dummy 2003	−0.244	−0.300	−0.0916	−1.637***
	(0.239)	(0.347)	(0.460)	(0.456)
dummy 2004	−0.0877	−0.479	−0.118	−0.0391
	(0.275)	(0.310)	(0.440)	(0.455)
dummy 2005	−0.499*	−0.290	−0.642	−1.019**
	(0.262)	(0.295)	(0.433)	(0.483)
dummy 2006	−1.311***	−0.0343	−0.572	−1.821***
	(0.293)	(0.302)	(0.454)	(0.478)
dummy 2007	−1.591***	−0.403	−0.235	−2.104***
	(0.272)	(0.323)	(0.435)	(0.504)
dummy 2008	−2.084***	−1.330	1.699*	−2.269***
	(0.344)	(1.380)	(0.976)	(0.782)
dummy 2009	0.0508	−3.735***	2.067*	−1.468*
	(0.387)	(1.353)	(1.223)	(0.816)
dummy 2010	−0.819**	−0.991	−0.740	−2.723***
	(0.380)	(1.409)	(1.047)	(0.767)
Observations	324	115	162	180
Number of regions	36	13	18	20
GDP growth pre-crisis effect	−0.276***	−0.357*	−0.206*	−0.531***
GDP growtheffect in 2008	0.0609	−0.522*	−0.497*	−0.450***
2008 effect t-test	2.605***	−0.655	−1.069	0.586
GDP growtheffect in 2009	−0.0476	−0.793***	−0.208	−0.694***
2009 effect t-test	1.815*	−1.565	−0.00710	−1.288
GDP growtheffect in 2010	−0.0284	−1.157***	−0.593**	0.0348
2010 effect t-test	1.199	−1.598	−1.382	3.302***
t−dummies F−test pvalue	0.000	0.158	0.117	0.000

Bootstrapped standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 14.A10 LSDVC estimates by macro-regions, with separate impacts of the crisis years, female total UR

Variables	*Continental*	*Anglo-Saxon*	*Southern*	*NMS*
turf(−1)	0.971***	0.295***	0.970***	0.911***
	(0.0387)	(0.109)	(0.0621)	(0.0498)
GDP growth	−0.115**	−0.175	−0.133	−0.241***
	(0.0569)	(0.126)	(0.0984)	(0.0639)
GDP growth(−1)	−0.105*	−0.124	0.0205	−0.120*
	(0.0614)	(0.119)	(0.0989)	(0.0652)
GDP growth*2008	0.0933	0.204	−0.000736	0.0938
	(0.0834)	(0.263)	(0.320)	(0.104)
GDP growth(−1)*2008	0.00826	−0.321	−0.490	−0.0123
	(0.120)	(0.258)	(0.420)	(0.114)
GDP growth*2009	0.145	−0.377	−0.0632	0.100
	(0.0919)	(0.503)	(0.354)	(0.0910)
GDP growth(−1)*2009	0.0311	0.480	−0.124	−0.0628
	(0.0884)	(0.440)	(0.316)	(0.105)
GDP growth*2010	0.0566	−0.279	−0.229	0.393**
	(0.139)	(0.290)	(0.184)	(0.161)
GDP growth(−1)*2010	0.285**	−0.263	−0.240	0.0469
	(0.113)	(0.214)	(0.295)	(0.0946)
Dummy 2003	0.0750	−0.228	−0.328	−0.416
	(0.243)	(0.283)	(0.572)	(0.439)
Dummy 2004	0.931***	−0.195	−0.827	0.418
	(0.285)	(0.249)	(0.551)	(0.440)
Dummy 2005	0.253	−0.285	−1.395**	−0.00114
	(0.259)	(0.236)	(0.553)	(0.467)
Dummy 2006	−0.352	0.235	−1.251**	−1.159**
	(0.296)	(0.242)	(0.588)	(0.458)
Dummy 2007	−0.891***	0.280	−1.042*	−1.653***
	(0.299)	(0.264)	(0.593)	(0.476)
Dummy 2008	−1.028***	1.026	1.607	−1.400*
	(0.386)	(1.120)	(1.282)	(0.756)
Dummy 2009	0.0216	−0.708	1.358	0.0296
	(0.435)	(1.040)	(1.567)	(0.808)
Dummy 2010	0.255	0.226	−0.00447	−0.810
	(0.425)	(1.115)	(1.333)	(0.729)
Observations	315	115	162	180
Number of regions	35	13	18	20
GDP growth pre-crisis effect	−0.220***	−0.299*	−0.112	−0.360***
GDP growtheffect in 2008	−0.119	−0.416*	−0.603*	−0.279**
2008 effect t-test	0.710	−0.577	−1.418	0.612
GDP growtheffect in 2009	−0.0436	−0.195	−0.299	−0.323***
2009 effect t-test	1.364	0.469	−0.557	0.306
GDP growtheffect in 2010	0.122	−0.841***	−0.581*	0.0791
2010 effect t-test	1.614	−1.491	−1.316	2.659***
t-dummies F-test pvalue	0.000	0.174	0.047	0.000

Bootstrapped standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

15 Young people in transitions

Conditions, indicators and policy implications. To NEET or not to NEET?

Guido Cavalca

In this dramatic period of increasing youth unemployment great attention is paid to the NEETs, those young people who are jobless and not in any form of education or training. In the UK, where this term was conceived, there is a substantial literature and empirical research on NEETs, while in Italy the term has only recently started to be used. The Italian literature appears limited and ambiguous: the term NEET is uncritically employed as an indicator of social exclusion, giving it a legitimation that appears questionable.

The mass media, explicitly aiming to influence social policies, simplify the complexity of the term: they emphasize its social relevance and trivialize the message, labelling disadvantaged young people as antisocial and economically useless. *Il Sole 24 Ore*, the official newspaper of the main Italian employers' association, describes NEETs as the 'immobile army of new labour illiterates' (Bassi 2011); while an article in the Dutch newspaper *Touw*, which correctly reports some of the figures and conclusions of a Eurofund report, cannot avoid generalizing and stigmatizing: '[the Eurofound researcher] looked at the background and the behaviour of these "couch potatoes" and what they are costing Europe. . . . Fourteen million young people sitting at home doing nothing in Europe' (de Werd 2012).

NEET is a comprehensive concept, able to gather up various categories of labour and social exclusion. We will suggest that NEET is a confusing concept. It includes heterogeneous labour market and social categories – active and inactive jobless, all levels of social background and education: young people experiencing very different life conditions and social risks. Its use will be critiqued by analysing the available empirical evidence and scientific literature, in particular for its consequences for orienting policies towards ineffective or even detrimental policy measures.

The NEET question: a brief literature analysis

The current disadvantage of European youth increases the importance of a critical reflection on the NEET category, from the theoretical, empirical and policy points of view. The UK literature has already critically tackled the definition and use of NEET (Yates and Payne 2006; Furlong 2006), whereas in Italy an accurate scientific discussion is missing and necessary.

NEET was used for the first time in 1999, when the Social Exclusion Unit (SEU), a consultancy agency of the UK government, replaced the term 'Status Zero' with NEET, even if not yet as acronym, indicating teens out of the labour market and education system: 'those 16–18 year olds who neither participate in education or training nor have a job (for at least 6 months during this period)' (SEU 1999: 15).

Since the 1990s the British government has been addressing the difficulties of the school-to-work transition experienced by those teenagers who at the end of compulsory education neither continue studying nor enter the labour market. The Blair government – in office from 1997 to 2007 – reformed policy measures for youth, introducing the new 'Connexions' service, which provides consultancy and vocational and social guidance for young people in difficulty, reorganizing the existing services, but keeping the neo-liberal customized approach. British policies against youth exclusion have been given special attention to combating early school leaving and under-education as well as household disadvantage and poverty, considered as main factors of social exclusion (SEU 1999: 24, 48). Another important political concern has been the supposed anti-labour youth subculture, defined as the lack of will to get involved in strenuous activities and to take on any kind of responsibility (Popham 2003), which is an influent element also in the Japanese context (Inui 2005). Japan imported from the UK the term NEET at the beginning of the new millenium during a period of social concern for the increasing youth unemployment and used it in combination with 'freeters' and 'ikikomori'. The first term combines 'free' and the German 'Arbeiter' (worker) and indicates those youngsters who, according to the Japanese mass media which coined this term, prefer fixed-term and short jobs in order to keep their freedom. The latter term relates to those young people who decide to escape society and its social norms. Not so much in the scientific literature as in mass media and in politics, it has been reinforcing the opinion that the 'freeter' or 'NEET' condition is being freely chosen by young people[1] and that a social disease is spreading in Japanese society. Then, the term NEET arose as a policy target (Yates and Payne 2006; Toivonen 2011) in order to address the risk of social exclusion and anti-social behaviours. This original feature of NEET in the UK and Japan has to be borne in mind, as it strongly influences policies addressing youth difficulties, in particular the question of being (on purpose?) inactive.

Doubtless the merit of this term is in calling the attention of public opinion and policy-makers to youth problems thanks to its capacity to synthesize various forms of vulnerability (Furlong 2006: 554). The most dramatic effect of this prolonged economic crisis could be the emergence of a 'lost generation' (Scarpetta *et al*. 2010) permanently excluded from productive activities: unemployment and joblessness have a scarring effect on long-term wages and careers (O'Higgins 2001, 2012). The synthetic property of NEET bears limits of clearness and scientific accuracy, if the use of the term does not take into consideration the different aspects of youth condition.

Many problems are related to this concept, such as its low precision and strong heterogeneity, the danger of labelling these 'neither-nor' youngsters as an underclass involved in social deviance and criminality (House of Commons 2010: 1, 8), and the individualization and criminalization of non-participant NEETs within the frame of the traditional pathologization of class inequalities (Simmons 2008: 434).

The use of NEET instead of the traditional indicators of labour and educational difficulties tends to shift public opinion and action towards the consequences of social inequalities more than their causes. The effect on public policies is to tackle these problems, as happens in UK with 'Connexions', through individualized counselling activities instead of welfare measures combating the unequal access to social and material resources with prevention (Yates and Payne 2006: 341–2).

One of the main weak points of NEET is to ignore a fundamental factor of social risk among young people: working instability and fragmented working careers. To some extent labour market deregulation (Esping-Andersen and Regini 2000) has eased entry into employment but also affected negatively the prospects of achieving stable work and continuous careers. In Italy this process increased social inequalities and risks of social exclusion as a consequence of lacking structural reforms of the welfare system (Barbieri and Scherer 2007; Cavalca 2010). The current recession has increased not only youth unemployment and the incidence of long-term unemployment, but also the prominence of temporary jobs, which in some countries have become the only form of new employment among young people (O'Higgins 2012). A public debate centring on NEET entails the exclusion from public policies of those young people who are at risk of poverty in spite of a job; in fact, unstable workers can be trapped in instability and can easily shift to unemployment. In Italy the adoption of the NEET approach could see priority being given to the employment of outsiders, at the expense of the 'mid-siders' (Madama *et al*. 2009), people with fixed-term jobs or with stable positions in small and medium-sized companies not supported by welfare measures in case of unemployment. Moreover, even accepting the neo-liberal approach considering empowerment as the new form of job stability (Boltanski and Chiapello 2005), temporary jobs are inadequate in terms of training content, which are provided (formally, at least) by other specific fixed-term contracts, like apprenticeship, internship or by open-ended contracts (Quintini and Martin 2006: 15; Michie and Sheehan 2003; Soskice 1997; Booth *et al*. 2002). Precisely the accumulation of human capital is considered essential for NEETs and that legitimizes this term as an indicator for policy purposes (Eurofund 2012: 25). Also the over-educated youngsters with permanent jobs or the (early and later) school leavers who moved rapidly into bad paid employment or poor quality training programmes are excluded from social support because they are in employment or training (Furlong 2006: 566), even if they do not acquire any skills.

Specifically as an indicator for social policies, NEET can entail the 'false positive' risk of giving support to non-disadvantaged people, who are able to enter the labour market but are included in the NEET subgroup even if they temporarily *choose* inactivity (Yates and Payne 2006).

The explicit aim of policies against NEET, namely its numerical reduction, is part of the more general 'indicator politics' adopted by the European Union (Leonardi 2009: 57): a quantitative approach to social problems which tends to ignore the quality of policies' effects beyond numbers. In the NEET case it means underestimating the quality of employment and training activities 'offered' to young people. If the general goal of job and education/training is naively positive, the real consequences of inclusion in education or working paths cannot be taken for granted in terms of their abilty to combat social exclusion.

Therefore, the NEET approach could foster a sly client selection by the public employment services: subjects with few disadvantages could be preferred to multi-disadvantaged persons, the more employable people preferred to the less employable (Yates and Payne 2006). Long-term sustainability is also critical: public policies could be positively assessed just because the NEET rate decreases, even if the labour market participation is not long-lasting or the training quality unsatisfying (Yates and Payne 2006): the welfare measures could not have addressed the social inequality factors and the transition from NEETs to insiders could be ineffective.

In the British context NEET was applied to a limited age range (13–19 or 16–18) which in Europe was extended to 24: it clearly shows the intention to tackle a specific group of young people at risk of social exclusion because of their lack of educational attainment and their inability to get a skilled, long-lasting and well-paid job. Even if this category includes heterogeneous social and individual conditions – social disadvantage, lack of cultural competence to get on in education, scant social capital, care and household tasks – tight limits on the age definition make it easier to use the term. The extension of NEET age boundaries cannot have effects other than adding heterogeneity to the concept (Eurofund 2012: 26) and reducing its effectiveness.

The NEET issue is examined in depth by international research centres with detailed theoretical and empirical works, which are not convincing with respect to the legitimation of this indicator. The definition can be really astonishing: 'young people currently disengaged from the labour market and education' (Eurofund 2012: 22). Unemployment is not at all a form of estrangement from the labour market, since the unemployed are by definition actively looking for work; unemployment is, if anything, a form of fringe participation.

The fundamental logic used to legitimate NEET is interesting: the indicator is illustrated, the difference with the unemployment rate has to be acknowledged and then it is suggested to use both in order to enrich the discussion about youth social risk (Eurofund 2012: 22–3; Scarpetta and Sonnet 2012: 5). So, the contribution of NEET is questionable, since it is not self-sufficient and the simultaneous use of different indicators is already suggested and employed in labour studies.

NEET as indicator of risk of social exclusion is contradicted by its supporters themselves, who show how the NEET condition is usually temporary. Many studies carried out in the UK show that the stable NEETs are a small proportion of the whole group[2] and some analyses at European level seem to confirm its temporary feature. 'The share of NEET youth in 1997 that spent the following five years in this status reached 30 per cent in Italy, 20 per cent in Greece and exceeded 10 per cent in several European countries. This suggests the existence of a small group of disadvantaged youth difficult to mobilize into work, even in countries where the position of youth in the labour market has improved over the past decade and where prospects for this group as a whole are rather bright' (Quintini and Martin 2006: 8).

Even if it is not convincing as a synthetic term, NEET draws attention to real problems related to youth conditions. Recent literature has underlined how the current recession hit young people harder than other age cohorts, as usually happens during downturn periods (O'Higgins 2012; Choudhry *et al*. 2012; Scarpetta *et al*. 2010). During these periods the NEET rate shows an increasing persistence (Bruno *et al*. 2014). The crisis effects are longer-lasting on young people than on adults. The main factors influencing youth conditions are the lack of educational attainment, lack of working skills and job experience, but also a long school-to-work transition and unstable jobs with few prospects (O'Higgins 2012; Scarpetta *et al*. 2010).

In particular, two critical groups emerge from empirical studies, the 'left behind' and the 'poorly integrated new entrants'. The first reveals cumulated multiple disadvantages – lack of educational attainment and social background – and is normally proxied by the NEET indicator; the latter group involves people with good educational attainment but unable to get a stable job position (Scarpetta *et al*. 2010).

The rising NEET question in Italy

NEET has been used for some years in Italy without adequate methodological and conceptual reflection. In particular, many reports of the main national research centres use this term and subject the issue to detailed empirical analysis.

The Italian National Statistical Institute (ISTAT) and the National Centre for Studies on Social Investments (Censis) tackle this question using a larger age range (15–29 years old) than that used at European level. This approach has the advantage of including young adults still in transition to adulthood, considered as complete autonomy from the parental household, which in Italy is postponed in comparison with other European countries. On the one hand, the inclusion of young adults up to 30 years old aims to consider various risks of social exclusion (Italialavoro 2011a: 5); on the other hand, it reduces the chances of comparing Italy with some European countries, where young people leave their families earlier.

ISTAT monitors NEETs in a yearly statistical bulletin (ISTAT 2012a), giving legitimation and spreading the term in scientific and political discussions. The National Council of Economy and Labour (CNEL) gives particular importance to the distinction between unemployed, completely inactive (jobless, not searching for and not intending to work) and potential labour force (jobless and intending to work even if not actively searching for a job). The NEET heterogeneity and its consequent low precision as an indicator is implicitly recognized by one of its supporters, when he tries to identify among NEETs those young people 'completely excluded by the labour market and not in any training and educational path' (CNEL 2012: 335). They amount to 38 per cent of young people and represent an unfulfilled potential, due to the shortage of job positions, inefficient matching of demand and supply, and inadequate vocational training programmes. To this group belong also those who have become discouraged, who have stopped looking for work because of recent failed attempts, lack of confidence, and the length of time required. The same conclusions on NEET factors come from a recent report on the Italian southern regions: '[the expansion of this group] is a consequence not only of the economic crisis and of the decreasing labour demand, but also of training policies, services and social policies which did not promote human capital development and companies' investments in young generations. In the absence of these policies it will be difficult to improve NEET conditions' (ISFOL 2012). Because of the current economic crisis – this report underlines – the NEET rate is increasing more in the North than in the South of Italy, where unemployment and inactivity are extremely deep-rooted.

Also the Banca d'Italia (2011) uses NEET in its reports on Italian social conditions as a synthetic index of labour market difficulties for young people. Data on the NEET exit dynamics over a period of 12 months are very interesting: less than 3 out of 10 youngsters start work or study in Italy, 4 out of 10 in the North, 3 out of 10 in the Centre and 2 out of 10 in the South, with a slight worsening of the situation from 2007 to 2009, particularly in the South.

The most detailed analysis was conducted by Italialavoro (2011a), an agency of the Italian Ministry of Labour, which focused on increasing exclusion from education, training and the labour market and on Italian and European policies to combat it. The use of microdata adds much information. First of all, the higher NEET rate in Italy is considered a consequence of discouragement and informal occupation; difficulties finding work depend not only on the traditional low level of labour demand for young people (Reyneri 2005), but also on the low educational attainment and scant professional skills, and on the inefficiency of the demand–supply matching delivered by the employment services. Moreover, the Italian NEETs are on the whole less educated than European NEETs, but have the same share of graduates, showing that education level is not sufficient to protect from labour market risks. Early school leaving is also a decisive phenomenon in Italy, even in the more developed regions where often the chance to find a job explains the decision to leave the education system (Ballarino *et al.* 2011). Among the NEETs who are inactive for care reasons (mostly women) only a minority would intend to work in the event of receiving support from work–life balance services, showing how strongly self-exclusion from the labour market operates.

All these reports are forced to produce some kind of NEET typology (among others Eurofound 2012), proving how its heterogeneity weakens its efficiency as a statistical and policy indicator. It shows exactly the paradox of the NEET approach: the necessity to go back to disaggregate the aggregated category in order to make it useful.

Among Italian scholars NEET is mainly used as an empirical support to the relevance of the risk of social exclusion involving young people. It is very effective to refer to a unique category in order to underline the diffusion of this social problem (Granaglia 2010; Livraghi 2010; Carrera 2012). The real issue is that NEET has never been discussed; it is automatically considered a valid indicator and legitimated by scientific debate. The uncritical acceptance of the whole

NEET category as the weakest part of society, at risk of being excluded from the 'social pact', represents a recurrent detrimental generalization, in Italy in particular: 'NEETs represent a moment of high weakness not only on a personal level but also and especially on a systemic level. They are a significant group of young citizens who risk being out of that social contract which supports the balance of the democratic system. These young people, who are out of the education system and do not manage to enter the job market, are the weakest part of our system and risk being trapped in a borderline condition on a working level and on a social level too' (Carrera 2012: 114).

Thanks to the availability of a great deal of data collected by ISTAT, several investigations on the school-to-work transition take the NEET question into account. Here a strong contradiction emerges: columnists, experts and policy guidelines pressure youth to increase skills and educational attainment, but the Italian labour market requires a large unskilled labour force, resulting in the phenomenon of over-qualification (Verzicco and Lo Conte 2012).

The necessity to differentiate NEET in subgroups emerges also from psychoanalytic studies on youth disadvantage which rule out the hypothesis of a generational pathology (Zoja 2011: 25–7). In order to avoid stereotypes and labelling, the category has to be split into young people with socio-economic obstacles (exogenous NEETs) and those who, similarly to the Japanese model, choose this status and could suffer psychological problems (endogenous NEETs) with an overrepresentation of young men (Zoja 2011: 24).

Youth in the European labour market: is NEET a useful indicator?

The analysis of social risks from exclusion from the labour market, training and education makes use of several indicators, such as the early school leavers rate, the unemployment rate and the age discrimination index, which make it possible to monitor labour market dynamics and disadvantage factors. The aim is to verify whether the NEET indicator can make any original contribution to research on youth disadvantage; the limits of this category (Furlong 2006) represent an excellent starting point.

First of all, the composition of youth with respect to work and education (Table 15.1) shows that almost one out of eight European youngsters can be labelled as NEET: 12.9 per cent of people in the range 15–24 neither work nor study. Figures vary widely by country: in the southern countries around a fifth of young people can be considered NEET, with Italy showing the highest share in the EU (22 per cent); in the UK they represent more than one-eighth of young people (13.3 per cent), while other countries have a NEET rate under the European average (less than 8 per cent). The social alarm about NEET seems to be justified only in the Mediterranean countries, which have the worst labour market conditions for the whole population, and to some extent in the UK.

Around one-third of European young people have a job; some of them are also participating in education or training programmes ('total employment' in Table 15.1); as exclusive activity ('only employment') employment involves nearly one out of five young people. A higher participation rate can be found

Table 15.1 Young people (15–24) by employment and education/training status, 2013

	EET	*ET*	*Total edu-training*	*Only employment*	*Total employment*	*NEET*
EU-27	14,1	54,4	68,6	18,3	32,4	12,9
EU-15	16,5	52,4	68,9	18,3	34,8	12,7
Denmark	41,2	40,3	81,5	12,4	53,6	6,0
Germany	26,5	46,8	73,3	20,3	46,8	6,3
Greece	1,9	67,8	69,7	9,9	11,8	20,4
Spain	5,4	64,6	70,0	11,4	16,8	18,6
France*	13,0	60,2	73,2	15,6	28,6	11,2
Italy	2,2	61,5	63,7	14,1	16,3	22,2
Netherlands	45,2	32,6	77,8	17,1	62,3	5,1
Austria	27,0	39,1	66,1	26,8	53,8	7,1
Sweden	20,5	50,9	71,4	21,0	41,5	7,5
UK	19,9	39,5	59,4	26,7	46,6	13,3

Note: EET, in employment, and education or training; ET, in education or training; edu-training and total employment are respectively sum of young people involved in educational and working activities as exclusive or coexistent activities.

* Break in time series

Source: Eurostat

in the UK and Austria, with one out of four youngsters; youth employment is particularly low in Greece, Spain, Italy and France.

Around two-thirds of young persons are involved in education/training activities while working or not (‘total edu-training’ in Table 15.1): Denmark, Netherland, Germany, France and Sweden show the highest shares (above 70 per cent), since they have more youngsters in employment and education or training (EET) than the other countries, except for France which is above the European average for education and training, but not for employment.

A limited share of NEETs depend of course on an inclusive labour market, but especially on efficient education and training systems, which strongly diversify youth conditions in Europe. Systems combining education or training programmes and employment make the difference more than those systems based on only education programmes. In Austria, Denmark and the Netherlands at least half of the young population is at work and a substantial proportion continue to study or participate in training activities. In Denmark and the Netherlands EETs represent the largest subgroup, exceeding also the number of students (ET), meaning the highest level of labour market participation (around 54 per cent and 62 per cent, respectively) in Europe; most of these young people are part-time workers continuing in education.[3] In Germany and Austria, part-time employment is limited (around 20 per cent)[4] and even under the European average, and the outstanding EET share – lower than in Denmark and the Netherlands, but above the European average – is produced by the well-known dual system, which provides an internship combining education and on-the-job training (Brunello *et al*. 2007). The UK share of employed young people is also rather high, above the European average and similar to Germany, but it is due to an early transition to the labour market and the consequent low participation in the education system.

In general the high NEET rate is due to early school leaving. In comparative terms in the UK the reduction of this latter phenomenon seems more decisive than a further push towards employment; in the southern countries the low level of labour market inclusion coincides with a feeble combination of job training and education. In this case the problem is the low capacity to create job opportunities for young people, but also to support school participation and to give real chances of job training. The French case can be considered typical of Europe: the 'neither-nor' share is at the European average but is lower than in the Mediterranean countries thanks to good labour market participation and to a substantial share of young people in education.

The choice of the age range is a critical issue in relation to social policy in general and NEET in particular (Tabin and Perriard 2014), as is shown in Table 15.2, which compares the range usually chosen in European statistics on young people (15–24, with its subgroups 15–19 and 20–24), with that chosen by ISTAT (15–29, and the subgroup 25–29).

Most NEETs are over 20, whereas this indicator arose to address conditions for teenagers. In Europe the NEET rate ranges from 7 per cent in the range 15–19 to 18 per cent in the range 20–24 and 20 per cent among young adults; among teenagers, NEETs exceed 10 per cent only in Italy, Spain and Greece. The NEET share increases in the age range 20–24 in every European country considered and reaches its highest levels in Spain (26 per cent), Italy (31 per cent), Greece (32 per cent), and a substantial level in UK (18.5 per cent) and France (15.9 per cent). NEETs increase further among young adults (25–29).

According to the NEET approach the risk of exclusion stems from an early exit from the education system and from the difficult transition to the labour market due to a lack of job skills; the strong increase in NEETs among youngsters aged 20

Table 15.2 NEETs by age, 2013

	15–19	*20–24*	*25–29*	*15–24*	*15–29*
EU-27	6,6	18,5	20,9	12,9	15,8
EU-15	6,7	18,1	20,1	12,7	15,3
Denmark	3,2	8,7	10,8	6,0	7,5
Germany	2,6	9,5	13,0	6,3	8,7
Greece	10,2	31,3	42,1	20,4	28,5
Spain	10,1	26,3	28,7	18,6	22,5
France*	6,6	15,9	18,8	11,2	13,8
Italy	11,4	32,0	32,9	22,2	26,0
Netherlands	2,2	7,8	11,1	5,1	7,1
Austria	4,7	9,1	10,4	7,1	8,3
Sweden	4,0	10,3	8,7	7,5	7,9
UK	7,3	18,5	17,1	13,3	14,7

* Break in time series

Source: Eurostat

or over and among young adults shows the more general difficulties of the labour market in absorbing the supply of youth labour. Thus, the NEET indicator has the disadvantage of confusing different social phenomena or groups.

As recalled several times, NEET includes unemployed people, an active part of the labour market. In Europe as a whole they represent half of NEETs, in France 58 per cent and in Greece and Spain exceed 70 per cent (Table 15.3). This shows how improper and misleading it is to consider NEETs as inactive and marginal people. Interestingly, Germany, the Netherlands and Denmark, three of the four most inclusive labour markets, show the highest share of the inactive population among NEETs (around 60 per cent); in Austria, another highly inclusive country, the inactive NEETs equal the active ones. From this point of view, in the countries where young people run a weaker risk of social exclusion (even admitting that NEET is able to measure it), they are proportionally less inclined to enter the labour market than in the other countries.

Moreover, even the unemployed are strongly diversified, since for example long-term unemployment represents an actual risk of social exclusion, whereas unemployment and NEET can be temporary conditions. It is also evident that to be unemployed in Greece, Spain and Italy, for example, is generally riskier than in other countries, considering the labour market problems as a whole.

If the intention to work is considered, the percentage of young people who would potentially be willing to work greatly exceeds the percentage who are formally unemployed; this suggests the enormous difficulty of integrating young people into national labour markets and the feelings of discouragement felt by the young when it comes to finding a job, since a substantial part of them have stopped searching for work.[5]

Differences within Europe are substantial but softened by the fact that in each country most NEETs, between 62 per cent and 83 per cent, would like to work;

Table 15.3 NEETs (15–24) by job search and willing to work, 2013

	NEET	*% Unemployed*	*% Inactive*	*% Willing to work*	*% Unwilling to work*
EU-27	12,9	52,7	47,3	73,6	26,4
EU-15	12,7	53,5	46,5	74,8	25,2
Denmark	6,0	35,0	65,0	61,7	38,3
Germany	6,3	44,4	55,6	66,7	33,3
Greece	20,4	70,1	29,9	76,0	24,0
Spain	18,6	71,5	29,0	83,3	17,2
France*	11,2	58,0	42,0	74,1	25,9
Italy	22,2	43,7	56,3	77,5	22,5
Netherlands	5,1	39,2	58,8	66,7	33,3
Austria	7,1	46,5	53,5	80,3	19,7
Sweden	7,5	49,3	50,7	66,7	32,0
UK	13,3	53,4	46,6	72,9	27,1

* Break in time series

Source: Eurostat

moreover, the highest share of NEETs unwilling to work can be found in Germany, the Netherlands, Denmark and Sweden (around a third), countries with a low quota of NEETs. Following the NEET logic, this group (a quarter of NEETs in Europe) should be considered as unproductive human capital or as subjects without social ties and motivations. Actually, it can be assumed that some NEETs unwilling to work are waiting for (or evaluating) job opportunities, or are involved in voluntary work, which can offer more training chances than many temporary jobs; moreover, they could benefit from favourable social conditions and choose to remain out of the labour market and education/training without any kind of social risk.

Data analysed so far have shown that many differences among NEETs are hidden just by the heterogeneity of such a broad category, and many other elements could be found with further examination.

Educational attainment, which strongly affects labour market opportunities in general, goes in the same direction (Table 15.4). In Europe NEETs can be roughly equally divided into those with low (compulsory education) and middle or high levels of education (secondary school and university),[6] but the composition varies considerably by country: education affects the NEET phenomenon in the opposite way, confirming its heterogeneity. Therefore, it cannot be asserted that the difficulties in entering the labour market depend on low levels of education and that the NEET condition relates to the willingness to choose the 'right' job. Factors explaining this issue vary by country: policies addressing under-education cannot simply be generalized as *the* solution but must depend on contextual conditions.

In general, the proportion of people who are highly educated increases within the 20–24 range. Different profiles can be identified by looking at educational

Table 15.4 NEETs by level of education, 2013

	15–24			*20–24*		
	All	*ISCED 3–6*	*% ISCED 3–6*	*All*	*ISCED 3–6*	*% ISCED 3–6*
EU-27	12,9	7,1	55,0	18,5	11,2	60,5
EU-15	12,7	6,6	52,0	18,1	10,3	56,9
Denmark	6,0	2,8	46,7	8,7	4,6	52,9
Germany	6,3	2,6	41,3	9,5	4,2	44,2
Greece	20,4	15,1	74,0	31,3	23,5	75,1
Spain	18,6	6,1	32,8	26,3	10,1	38,4
France*	11,2	6,1	54,5	15,9	9,9	62,3
Italy	22,2	12,9	58,1	32,0	20,4	63,8
Netherlands	5,1	2,1	41,2	7,8	3,6	46,2
Austria	7,1	3,4	47,9	9,1	5,3	58,2
Sweden	7,5	4,5	60,0	10,3	6,6	64,1
UK	13,3	7,8	58,6	18,5	11,3	61,1

* Break in time series

Source: Eurostat

attainment. In Spain, the Netherlands and Germany the less educated prevail, whereas in Greece, the UK, Italy and Sweden the 'neither-nor' status is more concentrated among young graduates. In France, Austria and Denmark, similarities between the two subgroups can be observed among young people overall; in the first two countries the more educated youngsters represent the majority of the 20–24 category.

In conclusion, it can be argued that the NEET label cannot provide original information in comparison to the traditional indicators. Furthermore, the use of this new indicator tends to conceal features and dynamics often diverging among countries.

The policy implications of NEET: a workfare Trojan horse

Specific policies to deal with NEET do not exist in Italy. Measures addressing early school leaving, inactivity and unemployment, implemented in recent years, are limited, in particular in terms of active policies, and substantially ineffective. The use of internship has actually increased labour market participation,[7] but it needs accurate controls on training and vocational guidance (Rizzoli 2010). Apprenticeships, the main policy measure against youth exclusion in UK and in the European guidelines, have been underutilised in Italy (Italialavoro 2011a: 129).

According to my literature and data analysis, NEET is ineffective as a policy indicator: it adds little by way of substantive information and its only merit is that it summarizes different data and communicates them effectively, albeit at the cost of precision. The NEET definition is unconvincing not only because of the heterogeneity of social features and risk factors ascribed to young people, but also because it is vague about the actual realm of social disadvantage and risk of exclusion.

The logic of the NEET approach appears fruitlessly complex. To be effective in terms of policies, this synthetic indicator needs to subdivided into specific population targets, jettisoning its summarizing nature. In fact, the related policy measures have to be customized by employment services, which require more specific subgroups to identify the target populations. It is indeed questionable whether this complex logic can give effective and efficient results, especially if compared with (at least logically) simpler policies tackling social inequalities.

From that point of view, the use of multiple indicators is recommended, since youth unemployment and labour market withdrawal have multidimensional causes and need a comprehensive approach (ILO 2011; Renold *et al*. 2014). NEET should be replaced by these indicators, preferably differentiating among homogeneous groups of young people, who share the same social risks and need specific policy measures (O'Higgins 2001: 164). As showed in the previous section, it could be useful to differentiate NEETs by their willingness to work, their actual attempts to search for work, their age cohorts and education levels, not just to identify the different dynamics producing social risks, but also to design effective policy measures. At most, NEET could be used just as a (rather imprecise) proxy measure for the already mentioned 'left behind youth' (Scarpetta *et al*. 2010;

O'Higgins 2012; Brada *et al*. 2014), a vague but evocative category, useful for drawing public attention to youth social risks.

The UK experience makes even clearer the policy implications of NEET and the necessity to discuss this concept critically before introducing it among the policy objectives in other countries. It is not a question of the outward aim of the NEET approach, namely the reduction of youth inactivity and risks of social exclusion, but of the uncritical adoption of this policy target which has proved to be so ambiguous and with a precise political slant: the workfare approach (Mead 1989).

The recent strong visibility of NEET in the public debate can be mainly attributed to an (explicit or not, informed or not) adoption of the workfare approach, which entails the individualization of social risks and therefore of public policies at the expense of combating overall social inequalities. The strong political feature of the NEET approach is based on activation and empowerment with a top-down dynamic (Ruffino 2010; Bonvin and Moachon 2008) and produces a strong stigmatization.

Policies put pressure on young people to take part in education or training and to get any job in order to increase their empowerment and human capital. To this end, the quality of employment and the effectiveness of education and training have to be considered a key question: the adoption of NEET policies needs attentive checks, which in Italy are not an essential part of the welfare system and therefore cannot be taken for granted. Any new labour market policy in Italy has to be slotted into a fragmented welfare system lacking measures against new (labour market dualization) and traditional (poverty) inequalities (Ferrera 1996; Esping-Andersen and Regini 2000). A radical shift towards activation policies would require a general reform of the welfare system, integrating new active policies with reinforced passive ones, in particular a universal measure of unemployment protection and social assistance (Brada *et al*. 2014). A radical reorganization of job centres and thorough staff training (Gualmini and Rizza 2011) are also fundamental: in spite of various attempts and much discussion, it needs careful planning and substantial economic resources.

Policies to deal with NEET have revealed problems even in the UK. The reduction in the numbers of NEETs could have adverse effects, precisely because of the heterogeneity of this category. The selection of welfare recipients in favour of the less disadvantaged and more employable young people, which has been occurring in Britain, represents an even greater risk in Italy because of resource scarcity, service inefficiency and fragmentation of regional welfare systems (Ascoli 2011). Youth participation in the labour market could also become less sustainable, given the structural and contingent difficulty of creating jobs in Italy. The short-term effects of a training course or a temporary contract could entail return to the NEET condition without any reduction of social inequalities or social exclusion risks.

In conclusion, the identification of youth social problems with the NEET category is misleading because, while broad in nature, it ends up excluding temporary workers, who not only experience economic problems but run the risk of a troubled transition to adulthood in the medium term and of social exclusion in the long term.

Considering the long duration of the current crisis and the stronger responsiveness of youth employment to recession than to recovery periods, in particular in countries with flexible labour markets (O'Higgins 2012), it is extremely important to support policies fostering, in the long term, permanent jobs and long-lasting careers. Investments in educational and training programmes and school-to-work institutions are necessary in those countries where youth unemployment and labour market withdrawal are very high, but the quality of policy measures and the variety of youth conditions are decisive.

Labour market policies for young people should address social inequalities and promote inclusive and high-quality education and employment rather than pushing towards *any* available training programmes and jobs. The fragmented conditions of young people undoubtedly require accurate analysis with multiple indicators and policies able to address the risk factors and not just their effects.

Notes

1 The Japanese definition of NEET includes youngsters and young adults (15–34 years old), single, dependent on parents, but does not include people who are unemployed and looking for work (Inui 2005).

2 Estimates on UK can be up to 20 per cent. Italialavoro (2011b: 107) reports research by the British Department for Education and Employment (DfEE); Furlong (2006) illustrates results of his own research and others'.

3 In Denmark and the Netherlands part-time young workers constitute the majority of employees (66 per cent and 78 per cent, respectively), with a higher share among women (according to 2013 figures from Eurostat). The main reason for part-time employment is continuing with education and the rate of involuntary part-time work is extremely low.

4 Figures for 2013 from Eurostat.

5 In Italy the feeling of discouragement is very strong: in 2010, 10 per cent of all inactive people (ISTAT 2012b); among NEETs 12 per cent stopped looking for work in 2011 (CNEL 2012), in addition to them more than a third of the unemployed and a quarter of the inactive ceased searching for work because of care tasks, illness and other reasons, limiting the actual 'marginally attached' youngsters to quarter of official NEETs.

6 They are labelled as ISCED 0–2 and 3–6 respectively.

7 It is extremely favourable for employers: neither salary nor social insurance are compulsory.

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Index

Diagrams, graphs and tables are given in italics