



STUDIES IN ECONOMIC TRANSITION

ROADBLOCKS TO THE SOCIALIST MODERNIZATION PATH AND TRANSITION

Evidence from East
Germany and Poland

Edited by Jutta Günther
Dagmara Jajeśniak-Quast
Udo Ludwig · Hans-Jürgen Wagener

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Studies in Economic Transition

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PREFACE

State socialism in Eastern Europe has collapsed more than 30 years ago. Transition to different regimes of post-socialism can be considered as completed. Doing research on both events testifies not only to historical interests. It also contributes to the analysis of social systems and their change. The case of East Germany may be seen as exceptional: more orthodox than Moscow during the period of state socialism, more privileged than its neighbors due to West German assistance during the transformation. But when compared to other socialist countries, like Poland, East German exceptionality loses much of its weight. General trends assert themselves. At the same time, significant policy differences ultimately yield different transformation courses. Thus, we have a prolific field for comparative social systems research.

With such intentions in mind, a group of social science scholars from four German universities in Berlin, Bremen, Frankfurt (Oder), and Jena together with their cooperation partners convened in 2017. They planned a research project on systemic barriers to modernization in state socialism and the repercussions during the transition to a more liberal system. Main object of research is the GDR, but for comparative purposes, we also approached its eastern neighbor, Poland. The project found support from the German Federal Ministry of Education and Research, which allowed for the engagement of several doctoral students and postdocs, travel assistance for archival studies, and the organization of workshops as well as transfer activities. Especially the last two tasks were hampered by COVID-19, which confined our activity for at least two years. But these

roadblocks to normal work were overcome, and so we can share some of the research results in the present volume.

The core project team is working at the four universities mentioned above. This team works in close cooperation with several international scholars: Ksenia Gonchar (Higher School of Economics Moscow), Till Düppe (Université du Québec à Montréal), Piotr Koryś and Maciej Tymiński (University of Warsaw), and Knut Richter (State University of St. Petersburg). The exchange of views within this large group was intense even if communication was temporarily restricted to online meetings. A complex and multidisciplinary study like this can, however, not succeed without the comments, suggestions, and critical remarks of colleagues outside the research team. We are grateful to Frank Bönker, Robert Geisler, Rainer Karlsch, Uwe Müller, Florian Peters, Korneliusz Pylak, and André Steiner, who contributed helpful comments at different stages of the project. To produce an acceptable English text is a challenge and requires some editing by native speakers. Fortunately, we received help from Robert Canwell, John Catlow, and Lexi Walter. Of course, they are not responsible for remaining errors.

Many thanks are due to the German Federal Ministry of Education and Research for the generous financial grant (registration number 01UJ1806BY) and to Anette Rautenberg and Rolf Geserick, who accompanied the project supportively on its behalf. Special thanks also to our publisher Palgrave Macmillan and the editors of the series *Studies in Economic Transition*, Jens Hölscher and Horst Tomann, for accepting the book and fostering its production. Finally, we would like to thank the readership for showing interest in our work.

Bremen, Germany

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June 2023

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CHAPTER 1

Development and Modernization Under Socialism and After: An Introduction

*Jutta Günther, Dagmara Jajeśniak-Quast, Udo Ludwig,
and Hans-Jürgen Wagener*

I SOCIALISM IN EAST GERMANY AND POLAND

The catastrophe of World War II and its aftermath had a lasting influence on the social and political development in Central and Eastern Europe. Germany was the culprit of the catastrophe, and Poland was one of the most hurt victims. Both countries were confronted with severe war damages and the loss of great parts of their traditional territory. In the case of Germany, the split-up of the country, and in the case of Poland, the gain of new territories, massive demographic losses, and massive forced inner

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migration (see Chap. 2) were the consequences. The geographic, demographic, and geopolitical disruptions made it necessary to initiate a huge recovery program, reintegration, and transformation. Germany may be counted among the precursors of modernity already in the 1920s, while Poland still was backward in the interbellum period. They now implemented their recovery program under the paternalistic tutelage of the two postwar superpowers, which meant East Germany and Poland were under Soviet hegemony. Modernization was given different directions: while in the West the liberal modernization project was taken up again, in the East the Soviet collectivist modernization project was adopted.

The general historical development from 1945 to 1990 is well known and has been aptly told for East Germany by, among others, Dierk Hoffmann (2013), Jörg Roesler (2020), Klaus Schröder (2013), André Steiner (2004), and Hermann Weber (2012). For Poland, we can refer to Maciej Bałtowski (2009), Włodzimierz Borodziej (2010), Jerzy Kochanowski (2010), Wojciech Morawski (2011), Wojciech Roszkowski (2003), and Andrzej Leon Sowa (2011). The postwar period of both countries encompasses two transformations, the transformation into a people's democracy and a Soviet-type economy on the basis of Marxism-Leninism and the post-socialist transformation into a liberal democracy and capitalist market economy. In both countries, the old system bequeathed legacies to the new one, which did not always enrich the legatee.

This book is not about the macro lines of history. Rather, we try to shed light upon meso and micro issues to put flesh on the bare bones of the grand narrative. Why investigate the nooks of East German and Polish science, politics, and economics more than 30 years after the event? *Ex post* it is evident that state socialism has failed as a politico-economic system. This was not obvious at the beginning. System failure as a macro phenomenon manifests itself on the meso and micro levels in behavior, institutional

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constructs, material results, views, memories, and so forth. We want to find out “how did it come about?” Secondly, what went wrong, where was the path into prosperity and stability left, when was the point of no return (or reform) passed, and why? And thirdly, which remnants of the socialist system influenced the establishment of a new order? To answer such questions, particular aspects of growth and development, as well as individual elements of the system, will provide relevant information.

In 1990, a transformation of the political and economic system set in. Both countries have opted for an incisive change—shock therapy as it was called. In the case of East Germany, it was radical: rapid privatization or closure of state-owned firms and the immediate incorporation into the West German state and its socioeconomic system and hence into the European Union. Even if it was aided and cushioned by the western part of the reunified country, path dependency makes for the temporary persistence of old attitudes, habits, and practices. Necessarily, Polish transformation took a different path. It also came as a shock, but in particular privatization proceeded more gradually. Shortcomings and successes of the transformation cannot only be ascribed to the actual reform measures but have their roots in the conditions created by the socialist system. Here, significant differences between the two socialist countries can be identified.

The main focus of this book lies on the German Democratic Republic (GDR). To analyze the social development of one socialist country in isolation involves certain dangers: disregard of the wider context, ascribing typical traits to the socialist system in general and not to national idiosyncrasies, accepting the chosen path as being without alternative. The example of Poland serves as a palliative against one-sidedness and overdrawn judgments. Both societies were subject to a similar politico-economic system based on a Marxist-Leninist ideology and Soviet practice. But culture and tradition were different despite the geographic proximity. So, we may expect different attitudes and behaviors resulting in different outcomes and, next to common problems, some different stumbling blocks for development and growth.

2 MODERNIZATION

What is modern? This is the crucial question of the project. There is a large body of modernization theories and critical analyses, which have experienced a revival in the context of post-socialist transformation (Pollack 2008; Kollmorgen 2019). We cannot expect consensus on *the* theory.

Therefore, one should carefully distinguish between the concept of modernization and modernization theory. A simple version of the theory in American political science stems from Lipset (1959). It hypothesizes: the greater the welfare, the greater the chance of sustained democracy in a country. For democratic political institutions require, among other things, high levels of education, a well-developed communication infrastructure, a sizeable middle class, and social mobility, all of which develop in parallel with welfare. Empirical research has not contradicted the hypothesis, even if there are cases where economic growth resulted in long-lasting authoritarianism. Liberal democracy is seen as the highest stage of social development. The view culminated in Fukuyama's (1989) "End of History" propagating "the universalization of Western liberal democracy as the final form of human government" (ibid., 4). Obviously, communists, for whom communism is the final stage of historical development, will disagree.

Teleological visions cannot be of much help in analyzing the achievements and deficiencies of systems that deliberately chose alternative modernization paths. If modern society is defined as entailing liberal democracy, competitive markets, rule of law, protection of private property, civil society, and individualism, then it follows logically: "Fascism, state socialism, and fundamentalism, which according to Eisenstadt (2000 [...]) belong to modernity, are not modern" (Pollack 2008, 51). Yet, in its beginning, Soviet communism was seen, although not generally hailed, as a major step into modernity. Excluding it and its offsprings in Central and Eastern Europe from the history of twentieth-century modernization does not make much sense, even if, in the end, many of these societies have opted for a transition to the Western liberal variety.

Modernity is not just a form of government. It results from a long-term historical process of transforming static traditional communities into dynamic societies. Economic change, industrialization (Marx), cultural change, and religious views (Weber) have been suggested to be the main drivers of modernization. The process is aiming at democratization, emancipation, demographic development, urbanization, social mobility, structural change proceeding from industrialization to post-industrialization, scientific progress and innovation, health, welfare, economic growth, mass education, mass consumption, and so forth. It evidently is a process of co-evolution, and it is open-end with no definite state of society as ultimate outcome. The aims are universally valid and have been pursued by all modern societies. However, what an American scholar understands by democracy and what a GDR Politburo member understood by it would

not have been the same. By its name, the GDR was a democratic state. But at the same time, it was ruled by the dictatorship of the proletariat, that is, the working class, and its Marxist-Leninist party (see *Verfassung 1974*, Art. 1) and not by the rule of law. In short, the concrete interpretation of the general aims will be specific to a given society.

Liberal and collectivist societies differ most conspicuously in the route by which they try to implement the aims. For the twentieth century, we may very broadly discern a liberal route and a collectivist route, with Soviet-type state socialism as the most prominent representative of the latter. The distinctive properties of the routes are ideological—liberalism versus Marxism-Leninism or individualism versus collectivism—and institutional—private initiative and competition in economics and politics versus centralism, administrative planning, and the primacy of politics. Forty years on different routes may have led to different visions, values, and attitudes. In the process of transformation, many East German intellectuals were clinging to a vision of collectivist modernization, now purged of its authoritarian traits. This famously manifested in the complaint of former dissident Bärbel Bohley—“Wir haben Gerechtigkeit erwartet, bekommen haben wir den Rechtsstaat” (we expected justice, we got the rule of law) (von Münch 1994)—putting an expected virtue of *Gemeinschaft* over a key feature of modern *Gesellschaft*.

How can we assess the performance of different social systems? It seems plausible to use the development aims of the given system, which in the case of state socialism contained all the items enlisted above. But where shortcomings or failures are noticed, only a theory can hint at possible causes. Can modernization theory provide answers? Probably not if it is oriented toward Western democracy only. A suitable theory must address conditions which, across systems, are conducive to the attainment of specific aims. Take the example of economic growth. There are critical voices, but growth has been accepted by all capitalist and socialist countries as a desirable objective. Its material composition may be quite different according to idiosyncratic preferences, but growth theory identifies the influencing factors. Modern growth theory also contains institutional factors—thus, institutions matter (North 1994). If the GDR systematically hampers or blocks institutions like economic competition or global scientific exchange, this may be identified as a modernization barrier.

Politics, economics, and science, the core functional spheres of modern society, will flourish under the whip of competition. Even Marx and Engels have stressed the importance of rivalry for accumulation and technical

progress. Socialist central planning, on the other hand, suppressed this motive force for the most part. Competition as discovery procedure (Hayek 2002 [1968]) submits each innovation—scientific or economic—to a verification review, which decides about success or failure. Party conferences or Politburo decisions are weak substitutes. Modernization means learning, changing, exploring new combinations, and adapting to rapidly altering situations. Concentrating all decision-making authority at the top of a hierarchy will hardly do the job. The apparent modernization success of the Soviet Union in the first decades of its existence was a process of catching-up, for which central planning may have been instrumental.

The political and economic situation of Russia in the 1920s, when taking the authoritarian course, was fundamentally different from the situation in East Germany after the war. Russia's backwardness and international isolation made industrialization and technological modernization paramount for survival, as Stalin asserted. Gerschenkron (1962) hypothesized that in such a situation, the state can substitute for lacking entrepreneurship, savings, and financial infrastructure in order to provoke a rapid transformation of the economy. Despite war damages, East Germany was a developed industrial country whose modernization requirements were directed toward continuous structural change, research and development, innovation, and integration into the world market, that is, activities that call for entrepreneurial initiative as well as risk-taking and can only poorly be replaced by state bureaucracy. The Polish position was more comparable to the Russian than to the German situation. Poland was in many respects a backward country, and Polish politics were aware of it. Already in the 1930s, they turned to state planning to improve the situation.

Wasn't state socialism doomed to fail right from the start? This is an ex post rationalization. Indeed, Mises, Hayek, and the neo-Austrians in their wake were adamant about the impossibility of efficient economic calculation under socialism. The neoclassical mainstream, on the other hand, has stressed the theoretical equivalence of optimal planning and market equilibrium. During World War I, the idea of central planning, even in kind, was ventured theoretically by the Austrian economist and member of the Vienna Circle Otto Neurath and practically by Walther Rathenau. After the war, Mises' impossibility theorem triggered a lively debate on socialist calculation which, together with the Polish economist Oskar Lange (and Mises), crossed the Atlantic in the 1930s to challenge the Mises view. In these years, Germany, as well as Poland, set up four-year plans concentrating on investment—Germany to prepare for the war and Poland to cope

with the great crisis and its backwardness. After the war, socialism looked like a viable alternative to the utterly discredited capitalist system (Schumpeter 1950). New models of central planning were tried out: in the Netherlands by Tinbergen's *Centraal Planbureau* in The Hague, in France by *planification indicative*, and in Great Britain by the nationalization of coal and steel. In short, the idea of central planning was by no means unanimously dismissed theoretically and practically. Nothing of this was discussed in the GDR, where the Soviet-type system was the only option.

Ex post (or rather en route), it has become quite clear that the socialist path is not a freeway to modernity. Deficiencies were obstacles for successful modernization and resulted in retarded growth and development. This does not deny important achievements, particularly in those fields which can be effectively promoted by government policy, like education, health care, and income distribution.

3 SOCIALIST ACHIEVEMENTS IN MODERNIZATION

The roadblocks on the East German modernization path are obvious. They were caused by historical circumstances and systemic features. The question is whether there were any fast lanes. They are hard to identify unambiguously. According to its official self-image, the collectivist modernization project was in its entirety the only fast lane to modernity and should, within a short time, surpass the doomed bourgeois capitalist world. Overall, things turned out less propitious. However, certain elements of the collectivist project must be analyzed as potential or factual progressive steps—for example, large-scale farming and agricultural cooperatives. Of course, the immediate result was not overwhelming, but once central planning by state and party was abolished, East German agriculture, with still a sizeable share of large-scale cooperatives, proved to be a competitive modern sector of the economy.

We may call this phenomenon a “deferred success pattern”: an inherently productive measure does not yield the expected results because of systemic barriers, but it may display its full potential after the system change. A spectacular example is microelectronics in Dresden. In 1977, the Central Committee approved a program to establish this industry in the GDR, which was carried out at enormous investment costs. It failed to catch up with the rapid development in the West and to match the sharply falling prices in the world market (Marschall 2022 [1990]). Today,

Dresden is the largest microelectronics location in Europe, benefiting from the research capacity of its university and the quality of the local labor force created originally in the socialist period. Another example is the gradual concession to set up small-scale private enterprises and the liberal travel policy in Poland since the 1970s. They could not prevent the downturn of the Polish economy in the 1980s, but after the very short Polish transition crisis, they contributed substantially to the establishment of a market economy and to recovery and growth (see Chaps. 7 and 11).

Social policy is generally counted among the achievements of East Germany, in particular, the constitutionally guaranteed right to work. The subliminal or open threat of unemployment was unknown. Socialist men should react to this accomplishment by enthusiastically supplying labor according to their abilities, but they did not do so spontaneously. The apparent incentive problem was to be solved by payment according to performance, which was implemented by the old Taylorist device of piece rates. Their increase caused the uprising in June 1953. The eminent East German economist Fritz Behrens (1966, 10) formulated the crucial question of the socialist model: “How is material interest possible on the basis of the social ownership of the means of production?” It implies behavioral problems of the management as well as the workforce, which were not sufficiently analyzed in empirical research. Honecker’s 1971 policy switch to the so-called unity of economic and social policy, that is, a balance between investment and consumption, simply assumed that workers would work harder if their real income was rising and thus make possible sufficiently high rates of investment in productive capacity. In fact, those rates were falling during the 1970s and 1980s to keep up consumption growth and residential construction and avoid riots as had happened in Poland.

The Polish example reveals serious difficulties with the right to a workplace. Unemployment was shifted from the labor market, which did not exist anymore, to the state firms where it persisted in a hidden form. For the 1980s, it has been estimated to have been almost 30 percent in industry (Chumiński 2010, 112). This sheds a special light on post-transition unemployment, when it was shifted back again from the firms to the labor market. A second effect was the deterioration of the Polish work ethic. It contrasted quite unfavorably to the East German work ethic, which—according to Polish perception—was grounded in the qualification of the worker and his position in society (Mazurek 2005, 286–7).

The right to a workplace was only the first step of socialist social policy. The next step was egalitarianism. The conflict with the performance principle had already been highlighted by Stalin in the 1930s. According to GDR sociologist Wolfgang Engler (1999, 201), the East German society was a workers' society (*arbeiterliche Gesellschaft*): "Since society was a workers' society whose welfare presupposed a high degree of physical effort, it perceived itself best in the figure of the worker, most suitably of the hard labor performing man." Embedded in a stable (and static) social environment, the worker enjoyed an undisturbed way of life with social recognition, solidarity, and freedom from material hardship. However, the actual pattern of values and behavior prevailing in daily life needed some exhortation to meet the expectations of what the party understood by "the socialist man." The hard labor performing man was anyhow a dying species in the modern post-industrial world, which needed other role models. Egalitarianism and the right to work were socialist achievements that could hardly be transferred to competitive markets in the transition but made this change not particularly popular among the East Germans.

And the women? In an economy that was haunted by low productivity growth and chronic labor shortage, they were needed in production. The high rates of female labor participation and the legal, social, and educational provisions enabling them are often mentioned as major modernization achievements. Indeed, these developments, which East German policy supported resolutely, corresponded to a secular modernization trend. By contrast, in Catholic Poland, where socialism propagated similar trends, the church defended traditional attitudes with some success (Kleinmann 2022).

Next to the hard labor performing worker, the independent, self-confident woman was the second exemplary role model of East German society, and this with a much brighter prospect than the former. Nevertheless, the state-socialist society was patriarchal: the share of women in top political and economic positions remained negligible. This changed gradually after the fall of the Berlin Wall, which may be seen as further instance of the deferred success pattern (see Chap. 9). Social provisions like nationwide institutional childcare were soon taken over by the West. Yet, the necessary transformation of male behavior took place rather sluggishly, and policy was unwilling or unable to close the notorious wage gap between men and women, which persisted also in the GDR. Female labor participation had been higher in predominantly protestant East Germany already in the pre-socialist period to which level it more or less fell back

after reunification (Wyrwich 2021). Like the peak in the socialist period, this may have been due to demand, which dropped dramatically during the phase of extreme unemployment in early transformation.

While public care and education in early childhood in East Germany was well ahead of the West, the rest of the educational system showed specific traits due to different policy orientations. In general, the GDR attached great importance to practical abilities of pupils and students. This manifested institutionally in the general polytechnical school (*Allgemeinbildende Polytechnische Oberschule*), covering the first ten years of primary and secondary education. In addition, since the 1970s, it showed in the restricted admission to university. So, the share of the age group 20–25 years in education and the output of university graduates were noticeably lower in the East than in the West. Preference lay in relatively short vocational and polytechnic training. This was the result of the attempt to adjust the demand and supply structure of the educational system to the cost-minimizing qualification requirements of the economy (Ludwig et al. 1972, 195–201). A liberal system leaves this adjustment, for a great part, to individual decisions and the market. The share of unskilled workers in West Germany, on the other hand, was significantly higher than the East German level. The GDR successfully included all social strata into education. The effect of this policy on labor productivity is hard to measure. However, some doubts about the rationality of the political preference for vocational training were formulated, since economic productivity seems to have been supported more by university graduates than by qualified specialists (see Chap. 3).

The notorious productivity gap compared with West Germany—amounting in the end to more than 60 percent—had its causes in the mentioned roadblocks, among which education was perhaps the least serious. This is even more obvious for Poland which, as a relative backward country, had to fight illiteracy first before it could develop the labor force—but it did so successfully. Thus, the gap between the traditionally highly developed academic sphere and the rest of the population was narrowed considerably. Paradoxically, in Poland, it seems the system's achievements are those features that mitigated detrimental effects of the Soviet-type model of socialism: reversal of collectivization, support of the church as alternative power center, the establishment of an independent trade union (*Solidarność*), and keeping the country economically and intellectually open to the West.

4 THE DRIVERS OF WELFARE GROWTH: DIVISION OF LABOR, ACCUMULATION, AND INNOVATION

As we saw, modernization has evolved in conjunction with economic change and cultural change. Behind both stands the accumulation of knowledge as primary cause. So, technology and science are at the center of development. The modernization success of any society depends on its ability to foster technology and science and to transfer the results into the spheres of production organization and productive attitudes. Three eminent economists, Adam Smith, Karl Marx, and Joseph Schumpeter, have focused attention on the three drivers of productivity and welfare growth: division of labor, accumulation, and innovation.

The founding text of economics, Adam Smith's 1776 *Wealth of Nations*, has identified specialization and the division of labor as major sources of welfare growth. This is valid within the economic system due to economies of scale and comparative advantage. It has materialized over the centuries in an in-depth segmentation of productive units and specialization of professions and trades. This is also valid for the social system as a whole, where the basic social functions became differentiated and formed more or less autonomous subsystems: politics, economics, law, science, art, health, education, and so forth. And this is valid on the global scale: individual countries engage in the international division of labor and use their comparative advantage to realize gains from trade. All these developments are aspects of modernization. To impede these secular trends by deliberate or systemic barriers implies welfare losses. While proclaiming its profound modernization intentions, Soviet-type state socialism tended to erect such barriers.

“Communism is a program to reverse social differentiation and to overcome the fragmentation of the individual's way of living, two tendencies characteristic of modernity” (Lepsius 1995, 359). The intention is comprehensible in view of detrimental consequences of modernization: a lack of transparency, social isolation, alienation, and anomy. On the other hand, the horizontal functional differentiation into more or less autonomous spheres enhances productivity and innovation in these spheres and facilitates their management. They follow their own principles and values and use their own communication media. By contrast, Marxism-Leninism insisted on the primacy of politics. What does this actually mean?—seizure and unmitigated preservation of power, the Leninist ingredient of Marxism-Leninism. Functional elites had to be subordinated to the power

elite or the dictatorship of the proletariat, that is, the rule of the party leaders. This was managed by the *nomenklatura* system, that is, the allocation of top positions in all social spheres by the party leadership. “What happened was an enforced process of de-differentiation which deprived the economic, scientific, legal, or cultural subsystems of their independence and suspended their specific rationality criteria” (Meuschel 1992, 10). Functional efficiency was a second-order objective.

The spontaneous development of a differentiated firm structure with specialized medium and small firms was blocked by the general preference for large units, which, in the 1970s, escalated throughout the Soviet empire with the formation of combines. Such a firm structure alleviated the task of the central planner and shortened the shaky supply chains, but it resulted in monopolies slowing down structural and technical change. The division of labor in the industry sector was continually reduced. Combines tended to autarky. The depth of production increased instead of being reduced. Supply problems stimulated firms to produce needed inputs and repair services in-house. Concentration of production in a single combine hampered product diversification with repercussions for international trade where East German products encountered highly diversified foreign competitors. Intra-industry trade was little developed in the socialist world. Innovation could not penetrate production (see Chaps. 3, 4, and 5).

The international division of labor remained a notorious problem for Soviet-type economies. In a market economy, comparative advantage is revealed ex post by the activities of independent individual enterprises. In a centrally planned economy, it must be determined in advance and coordinated with the trade partners, which, in the case of Eastern Europe, were centrally planned economies themselves. Pricing is a serious difficulty in this context, with the result that comparative advantage is not known (see Chap. 6). While this sounds very much like the Mises argument about the impossibility of economic calculation under socialism, it testifies only to the incapacity of the state-socialist planners to grasp the problem and to cope with it adequately as some scholars had proposed. The closely linked propensity to autarky was fatal for the GDR and Poland. Like other economies of small and medium size, for technical progress in industry, they depended to a sizeable extent on foreign innovations, blueprint or embodied, to which they had limited access for financial as well as political reasons (Flade 2022).

Karl Marx had stressed capital accumulation as main source of economic growth: “Accumulate, accumulate! That is Moses and the prophets!” (Marx 1867, ch. 24). For him, its effects coexisted rather paradoxically with the immiseration of the proletariat under capitalism. In the Soviet Union, Stalin had followed the call realizing that rapid catching-up industrialization was crucial for the survival of the system. He pursued a policy of extremely high rates of accumulation and unbalanced growth favoring heavy industry. This model was taken over by his East European satellites in the first decennia of communist rule. Unbalanced growth remained characteristic of socialist economic policy. Typical for the GDR were the investment rushes in chemical industry in the late 1950s and 1960s, as well as in microelectronics in the late 1970s and 1980s—concentrating huge investments in these sectors and depriving less privileged sectors of urgently needed funds (see Chap. 5).

On the 24th Party Congress of the CPSU in 1971, Brezhnev reversed the policy of building socialism by favoring investment over consumption. In the GDR and Poland, new party leaders had recently been appointed. Erich Honecker and Edward Gierek followed immediately the Soviet lead. The 8th Party Congress of the East German Sozialistische Einheitspartei Deutschlands, the leading communist party (SED) propagated the new main line (*Hauptaufgabe*) of policy: “raising the material and cultural standard of life of the population based on a high pace of development of socialist production, the increase of efficiency of scientific-technical progress, and the growth of labor productivity” (Protokoll 1971, S. 61–62). This was a verbatim quote of the main line for the ninth Soviet Five-Year Plan (KPdSU 1971). The time of extensive growth was over. Intensive growth became the theoretical and practical problem of the next period.

The accession to power of Honecker and Gierek was initially met with great hopes for positive policy changes. In the case of East Germany, however, the more consumer-friendly policy was accompanied by a return to the traditional Stalinist planning methods, which in the end thwarted progress and growth. The new policy of “unity of economic and social policy” was backed by the assumption that people would work harder if they enjoyed higher consumption and better housing, allowing to keep up high rates of investment: economic growth depends directly on the growth of welfare, as Fritz Behrens (1966) had hypothesized. The crucial problem is the optimal relation of accumulation and consumption of which the East German planners had no empirically confirmed idea. In Poland, the eminent economist Michał Kalecki (1993 [1963]) had developed a sound

theory of growth under socialism. Already in the late 1950s, he had applied his insights in the planning commission, drafting a long-term plan for 1961–75. The party leaders did not heed his proposals but criticized them as too cautious. Planning optimism and overdrawn plans were notorious under state socialism. Kalecki left the planning commission frustrated in 1964 (Wagener et al. 2021, 215). His theories were not translated or discussed in the GDR.

For a time, it looked as if both accumulation and consumption could simultaneously be promoted at a high pace. Both countries took advantage of the favorable international credit conditions in order to import Western technology and also consumer goods. Both expected to be able to service the debts with higher and more qualified exports in due time. It did not work out—interest rates rose in the international credit markets, and both countries struggled with serious debt problems from the late 1970s onward. Increased efforts in export production became necessary, which narrowed the scope for accumulation.

The third source of welfare growth is innovation—Joseph Schumpeter’s contribution to growth theory. By innovation, we understand the application of new ideas in production yielding new products, production processes, and organizational change. Both concepts, growth and innovation, were treated in East German economics under different headings and in different contexts. A specialized growth theory, as, for instance, elaborated by Kalecki, was considered inappropriate for socialist economics. It had to be incorporated into the theory of extended reproduction. The word innovation entered East German economic terminology rather late. The economic encyclopedia of 1978–80 (*Ökonomisches Lexikon 1978–1980*) did not contain such a lemma. The core issue instead was scientific-technical revolution and progress. As such, it was treated as a highly relevant factor for the intensification of social reproduction. The crucial problem of innovation, the transfer of new ideas from science to production, was duly recognized (Heinrichs and Maier 1976, 223–90). What is missing in this context is the role of the firm and the entrepreneur—of course, since there are no entrepreneurs in socialism—in detecting new products, new processes, new markets, or new organizational constructs. This whole process was designed by central planning.

Scientific-technical progress implies innovation, though not only new products, production processes, and productive organization, but also a specific economic and social environment conducive to it. In Czechoslovakia, a large interdisciplinary research team had been set up in

the first half of the 1960s to analyze these implications, which resulted in the so-called Richta-report “Civilization at the Crossroads” (Richta 1966; not translated in the GDR). It reflected the reform thinking of the Prague spring. The GDR party leaders were heavily critical of market-oriented reforms, and any initiative into the same direction, political or scientific, was rejected as revisionist. The 1968 events marked the incisive turning point of East German modernization endeavors and rang the bell for the cautious GDR reform of 1963. Although 1968 was a year of crisis also in Poland, “normalization” had not the same historical systemic significance there as in the two highly industrialized socialist countries, Czechoslovakia and GDR.

Technological progress is, in the first instance, a question of research and development. Technical and engineering know-how had a long pre-war tradition, especially in the southern regions of East Germany with numerous small and medium-sized industrial enterprises. The GDR benefited from these capacities and developed them further in its educational system. It manifested in comprehensive invention activities that, however, only sparsely trickled down into the actual production process, chiefly due to organizational rigidities. The technological lags of the East German economy and the resulting low labor productivity are widely known. They derive from deprecated capital assets, structural deficits, retarded reinvestment, and slow innovation. Not all of that can be ascribed to inefficient science and engineering, which also suffered from capital scarcity. The main blockades happened in the central determination of research priorities and their time-consuming planning and execution, in a restricted flow of knowledge and excessive secrecy, and in limited incentives for the firms to innovate. So, innovation weakness became one of the major stumbling blocks of East German modernization and growth (see Chaps. 3 and 4).

Research and development on the level of the firm had been treated extensively in a handbook in 1976 (Autorenkollektiv 1976). The first East German textbook explicitly on innovation appeared only in 1988 (Haustein et al. 1988). Its main author, Heinz-Dieter Haustein, together with his colleague Harry Maier, had spent a research stay at the International Institute for Applied Systems Analysis (IIASA) at Laxenburg near Vienna, where they occupied themselves intensively with the management of technological innovation. It ultimately resulted not only in the textbook but also in an English language monograph (Haustein and Maier 1985), a rare achievement for East German economics.

The textbook made clear: “The potential of the new can only be developed and exploited by controlling the time factor [...] This requires a high resource flexibility and venturesome decisions” (Haustein et al. 1988, 62–3). Resource flexibility and risk-taking are endemic shortcomings of a centrally planned economy characterized by shortage. Each member of the Politburo, each minister, each director of a firm, or combine is eager to make sure not to suffer losses in their resource allocation for the next plan period. Where plan fulfillment has top priority, the risks of uncertain decisions will be wisely avoided, and necessary changes postponed as far as possible. For, “where one innovates, the efficiency potential of the prevailing technique will be undermined” (ibid.)—that is, what Schumpeter had called creative destruction as a precondition of innovation.

5 THE AGENTS OF INNOVATION

Who is driving innovation? The entrepreneur is the obvious answer since Schumpeter. The GDR, however, did not know the entrepreneur. It knew only the capitalist as a member of the exploiting class, a figure of the past. His field of activity, the independent enterprise, did not exist either. Production took place in publicly owned firms (*volkseigene Betriebe*) or, after the merger wave of the 1970s, in larger corporations (*Kombinate*). They were elements in a hierarchically organized system of central planning.

Entrepreneurship can be analyzed with Pierre Bourdieu’s concept of habitus (Schwarz 2022). According to Bourdieu (2002 [1984], 133–5), habitus is a form of (human) capital, “a kind of transformation machine which makes that we ‘reproduce’ the social conditions of our own production, yet in a relatively unpredictable way which cannot be transmitted by a simple mechanism from the knowledge of the conditions of production to the knowledge of the products.” Habitus is acquired, and it persists over a long period of time (hysteresis). Schumpeter could not have agreed more.

It is a sad fact that the GDR lost entrepreneurial talent in great numbers by West migration. Between 1945 and 1990, about 4 million people (out of 18.8 million in 1949) moved or fled to West Germany, the majority before the construction of the Berlin Wall, but in smaller numbers also after 1961. Private enterprise was eradicated in the GDR in three waves: first, by the immediate postwar nationalizations, then by full collectivization of agriculture up to 1960, and, finally, after Honecker’s access to

power, by the nationalization of the remaining 11,000 family firms in 1972. Private property of industrial firms became unlawful according to the constitution of 1974. What was left was a small bracket of individual handicraft establishments. Entrepreneurial spirit had hardly any scope for action under the GDR regime, and hence, very little could be transferred in transformation. In Poland, the situation was somewhat better. Forced collectivization was stopped in 1956, and exactly when the GDR abolished private or semiprivate firms in the early 1970s, Poland made first concessions to such firms. So, it is not surprising that Polish transformation and recovery was based on small-scale privatization and initiative from below (see Chaps. 7, 10, and 12).

A second group of innovation agents in any economic system are managers. In the first years of the GDR, the Stalinist economy was conceived as a uniform hierarchical system in which the firms were strictly subordinated to the higher authorities. Rational central planning reduced firm management to purely executive tasks without strategic decision-making power. There was no need for management science or business economics, which basically disappeared as a subject from the curricula (Wagener et al. 2021, 315–29).

It does not imply that socialist managers did not need particular skills. They lay, however, in a different domain due to the different character of a socialist planned economy. A market economy is demand-constrained (Kornai 1979). Its managers must be market-, cost-, and innovation-oriented. For the financing of their investments, they have to convince the capital market and the banks of the viability and profitability of their business. A socialist planned economy is supply- or resource-constrained. Its managers have to deal with the planning bureaucracy to obtain a feasible production plan and an adequate investment plan, the financing of which was the planner's concern. And they have to be on good speaking terms with their suppliers, labor force, and the party to secure the continuous flow of materials and cooperation. Problems with timely and appropriate delivery were one of the reasons for integrating individual firms into rather autarkic *Kombinate*, thereby reducing the diversity of the range of firms.

With the reform of 1963, it became clear that management and control of the firms was not only a question of party discipline and of technical knowledge. Traditionally, top management in Germany has been in the hands of technical personnel with a degree in natural science or engineering. This was also the case in the GDR. In the wake of the reform, the Central Institute for Socialist Economic Leadership at the Central

Committee of the Socialist Party (*Zentralinstitut für Sozialistische Wirtschaftsführung beim ZK der SED*) was set up in 1965, which might be called the business school of the GDR. Its director, Helmut Koziolok, was one of the (politically) highest ranking economists of the GDR. Socialist management science (*Leitungswissenschaft*) was complemented by Western approaches, which was legitimized by the authority of the Soviet academician Dzhermen Gvishiani. He was one of the founding fathers of the IIASA at Laxenburg, and his survey of the state of the art had been translated into German (Gvišiani 1974). Higher management, in particular the directors of the larger corporations (*Kombinate*), remained responsible for the smooth execution of the plan and stood under the supervision of the central planner. But they gained in competence and influence and, thus, were able to lead independent enterprises after the reunification if they got the opportunity.

The third group of innovation agents, obviously, are the central planners. The group consisted of the hierarchical superiors of the firms, the planning commission, and the ministries, controlled by the party, that is, by the secretaries of the central committee and the Politburo. The personnel of these institutions were recruited from the universities and high schools, in particular the High School of Economics. In addition, the educational institutes of the party installed at the central committee turned out elite personnel: the Academy for Social Sciences and the Party High School together with the mentioned business school. The characteristic of these institutes was their double nature: they had to keep a balance between academic aspirations and loyalty to the party and its ideology. Since the higher positions of bureaucracy were subjected to the *nomenklatura* system, ideological and political conformity together with a certain *esprit de corps* was guaranteed. The upright party soldier was, next to the hard labor performing worker and the self-confident woman, the third exemplary role model of the system. Decision-making in this huge bureaucratic apparatus took place according to strict rules and was very time-consuming. The main success indicator of socialist directive planning on all its levels was plan fulfillment. Its specific form had negative consequences for flexibility and was detrimental for risky and time-sensitive innovation decisions (see Chap. 5).

Plan fulfillment is universally the most widely used success criterion. If a top soccer team does not reach the Champions League, its coach is in danger of losing his job. If a capitalist enterprise does not meet its profit expectations, its rating and stock market value will go down. So, what is

wrong with plan fulfillment in the socialist context? Very simply put: the plan. Soviet-type economies formulated annual plans in terms of numerous obligatory plan indicators (control figures). Number and scope of the indicators were a recurrent issue of reform debates since they disrupted the consistency of the plan. A single synthetic indicator like profits would have presupposed, however, independently operating enterprises that were deemed a threat to the power of the party. Traditionally, the planner preferred the fulfillment of the plan in physical units as chief indicator, at least for the key economic activities. This leaves little room for the firms to optimize their present and future operations and makes them inert and stagnant.

The fourth group of innovation agents comprises those on whom the introduction of new products and new processes depends: inventors, R&D staff, scientists. These people are intellectuals and, hence, suspect to the party. But as scientific core of the innovation system, they were indispensable in the workers' and peasants' state. Research was largely centralized in the institutes of the Academies of Sciences. Restricting our analysis to science and technology (the social sciences were treated differently; see Wagener et al. 2021), it is obvious that costly basic research everywhere needs some form of state planning and state funding. This was also the case in the socialist countries with, perhaps, a little more formal central planning and control. But in a competitive market economy, some innovation takes place in small steps in medium and small enterprises and startups, a segment missing in the socialist system.

On the lower level, East German firms and combines had well-staffed R&D departments with skilled engineers. The human capital supply of the GDR economy appears to have been satisfactory. The transfer of new ideas to the planner and then to production seems, however, to have been sluggish. It is remarkable that individual intellectual property rights were protected—even though restrictedly. Inventions made in state-owned firms or state-financed institutions were granted a so-called economic patent (*Wirtschaftspatent*). The right to use it or dispose of it belonged to the state, while usufruct was divided between the state and the inventor, who received an inventor's compensation (Ökonomisches Lexikon A-G, 1978, 561; Hipp et al. 2022) (see Chap. 3).

Science always has been an international enterprise. Contacts with foreign peers, integration into the international publication and congress circuit, research residencies, joint teams—all this is conducive to scientific progress. A major shortcoming of the GDR science system was its

comparative isolation (see Chap. 8). The most obvious partner would have been West Germany, which for a long time did not recognize the East German state, and which, conversely, was the most denigrated neighbor, the imperialist enemy. Like Hungary, Poland could afford a much more liberal attitude. Travel restrictions were less severe, exchange opportunities were widely used, and even foreign financial support (by the Ford Foundation or the Humboldt Foundation, for instance) was gladly accepted (see Chap. 11). Cooperation within the Eastern block was formally promoted but remained tenuous. Where the GDR had the most intense interest, namely in computer science and microelectronics, the support of the leading Soviets was reluctant, holding back valuable information (Flade 2022).

This raises the question of what economists, or social science in general, could contribute to the smooth functioning of the economy. One may anticipate high aspirations since the collectivist road to modernity was paved by “scientific communism” with rationality claims and an unlimited planning optimism. However, ideological barriers impeded the development of a practically relevant social science. East German scholars were not expected to engage in critical analysis of systemic deficiencies and sources of productivity lags. This was different in Poland. Despite all ideological lip service, economics produced respectable contributions and gained international reputation, thanks to the eminent Oskar Lange, Michał Kalecki, Edward Lipiński, Aleksy Wakar, and their pupils (Wagener et al. 2021). These achievements stood in stark contrast to the finally poor performance of the Polish economy. In the GDR, the situation was rather the other way around.

Włodzimierz Brus (1961), for instance, could publish his “Functional Problems of a Socialist Economy.” A translation did not appear in the GDR but appeared only in West Germany. A similar fate befell Ota Šik’s (1967 [1965]) “Plan and Market Under Socialism.” Western economic theory was rigidly dismissed by East German scholars: “On the whole, [...] the sweeping devaluation of findings of non-Marxist scholars as apologetics was a fatal mistake of established GDR science,” as two East German economists admitted at the very end (Becker and Luft 1990, 1434).

Similar ideological barriers were less relevant for natural, technical, and medical sciences. This does not imply that these could flourish without obstructions. Over the whole period, science was confronted with ubiquitous material shortages and the lack of foreign exchange. This caused insufficient capital structures, equipment, acquisition of foreign literature,

and restricted opportunities to travel abroad. In addition to tight financial means, political constraints existed, that is, external measures (Cold War) and, above all, internal measures. Political reliability became an important criterion for entering the ranks of *nomenklatura*, which distributed the higher positions also in science. All contacts with Western institutions and colleagues were strictly controlled. State security was a constant observer of science. Publications were classified and, if intended for foreign journals, had to be authorized by the superiors. Integration into the international scientific community was not prohibited but seriously hampered (see Chap. 8). Scholars can react in different ways: from the triad exit, voice, and loyalty (Hirschman 1970), exit was barred in 1961 by the Berlin Wall, and voice was choked by recurrent disciplinary measures, like the revisionism campaign in 1956–57 or the Havemann affair 1964–66. So, only loyalty remained as default option, the sincerity of which is hard to assess. Many scholars reacted with frustration and retreated into politically neutral backwaters.

The transformation in 1990 implied by its very nature a dramatic change of elites (see Chap. 9). The existing innovation system was destroyed with partly drastic consequences for the participating agents and, hence, output (von Tunzelmann et al. 2010). While large parts of the industrial structures turned out to be outdated and unprofitable, this was not the case for the labor force. To put it to productive use, however, large capital investment and a new organizational environment became necessary. Alternatively, labor migrated to the West.

The unification treaty of 1990 spoke euphemistically of “fitting in science and research ... into the joint research structure of the Federal Republic of Germany” (Einigungsvertrag 1990 Article 38.1). Actually, this meant dissolving the GDR Academies of Sciences with their about 30,000 employees, evaluating the scientific productivity and political past of these people and discharging them, where deemed appropriate (*Abwicklung*). The rest was reorganized in independent institutes, universities, and West German research organizations like *Max-Planck-Gesellschaft* or *Fraunhofer-Gesellschaft*. Scholars who stayed in their jobs benefited greatly from the new freedom and could participate unhampered in the international scientific community (see Chap. 8). Research and development in industry was affected even more. Rapid privatization led to the closedown of many establishments. In the firms that were chosen for privatization, cost reduction efforts affected mainly the R&D and

social care departments. In Poland, these processes took place at a slower pace, since large-scale privatization was approached more gradually.

The immediate separation of state and economy made the group of central planners redundant. The State Planning Commission disappeared, the ministries were integrated into Western ministries or closed, and the party apparatus was dissolved. At least during the transitional period, the incorporation of the GDR into the Federal Republic was accompanied by the transfer of higher staff into administration, the judicial system, and other sectors that were less developed in a socialist system, like banking, insurance, and accounting. The fate of the managers depended, of course, on the fate of the firms and combines. This was determined in the first instance by the *Trenhandanstalt*, a transitional government institution administering the economy, and then by the new owners if they could be found. In most cases, particularly for the larger firms, the new owners came from the outside, mostly from West Germany, bringing in their own personnel.

In some cases, former managers were successful in the privatization process, becoming new owners and, thus, entrepreneurs. The rules of the game of a market economy including their administrative idiosyncrasies could not have been learned under state socialism. They were quickly adopted through expert advice from Western colleagues and through learning by doing, which inevitably resulted in quite a number of flops (see Chap. 12). Thanks to the more liberal policy attitude in Poland, entrepreneurs got acquainted with the respective know-how and skills already during the last years of the previous period, which made for a gentler start there (see Chap. 11).

6 BARRIERS TO SUCCESSFUL MODERNIZATION

Identifying the various difficulties, barriers, and obstacles for growth, welfare, innovation, or modernization can be done from two points of view. With the advantage of hindsight, the collapse of state socialism is explained as logical or inevitable consequence of its systemic deficiencies. The historiographic alternative is a frontline approach: to tell the story in its respective actual context in time. This would imply a focus on historical development, contingencies, and (missed) reform options. Concentrating on the systemic properties and policy choices which supported or impeded the ultimate success of the collectivist modernization project does not mean that the trajectory was unavoidable. For the individual socialist

countries, we can discern different periods with specific policy options. The GDR reform of 1963, for instance, opened up, although hesitatingly, opportunities that might have led to an alternative development path.

The system was launched with great expectations in Central and Eastern Europe after the catastrophe of the Great Depression and World War II. Its failure is a fact. The transition to the liberal modernization path has been affected by legacies from the preceding social order, which by no means have all been negative. Examples of positive achievements have already been mentioned. The most serious impediment for growth and modernization was the fatal inability of the leading strata to reform the system. The 1963 reform was gradually discontinued at the end of the 1960s and finally abandoned with the political change from Ulbricht to Honecker. In 1979, scholars and planners again pleaded for an integral reform of prices, one of the major stumbling blocks of the system. It had been elaborated and even initiated when Honecker all of a sudden called it off fearing Polish-style resistance (Malycha 2012). Political stability was deemed more important than economic rationality.

Barriers to successful modernization can be arranged in four groups:

- External
- Material-technological
- Organizational
- Political-ideological

They are not independent of each other but rather intertwined in a complex maze of policy constraints. External factors derive from the geopolitical situation of the period, in short, from the political-ideological divide into East and West and, hence, from Cold War. As part of the Soviet empire, the GDR stood in the frontline facing West Germany, which only grudgingly accepted its existence and the new borders. This required large expenditures for internal and external security, which burdened the investment budget. Export embargos (by the Western Coordinating Committee on Multilateral Export Controls or CoCom) hampered the import of high-end technology. In addition, autarkic tendencies (*Störfreimachung*) at home thwarted the international division of labor. Foreign trade relations placed special weight on inner-block or Council for Mutual Economic Assistance (CMEA) trade, whose share in world trade was rather small. And the CMEA trading partners were in general less developed than the GDR.

Such factors contributed to material backlogs and shortages. Unavailability and forced substitution of special technologies and intermediate inputs, delivery delays, lacking reinvestment funds: these typical examples were a permanent problem. János Kornai (1980) has analyzed the material situation of socialist firms as economics of shortage, that is, as a notorious disequilibrium characteristic of the system. He explained the phenomena by organizational idiosyncrasies of state socialism, the third road block to modernization.

Plan fulfillment as central performance criterion, a quasi-monopoly structure of industry, soft budget constraints, paternalism, and lacking international competition undermine the motivation to take risk, to innovate, to look for new combinations. If strategic decisions happen centrally, bureaucratic lethargy and simply the lack of appropriate information result in slack and the danger of misallocation. Of course, independently operating firm managers in market economies face similar difficulties. The difference is that their mistakes will be taken advantage of by competitors, and if not adapting quickly, they will be eliminated from the market.

Marxism-Leninism as constitutive ideology of the Soviet-type system has determined the collectivist modernization path. Here is not the place to elaborate the concept and its political and economic implications. It is sufficient to observe that socialism understood itself as a transitory state in the historical development from the liberal bourgeois society to the next historical stage, communism. Its properties were the dictatorship of the proletariat or unconstrained party rule in politics and social property rights, rigid centralization of decision-making, and administrative planning in economics. In consequence, individual initiative within the rule of law, market coordination, and competition were excluded from its institutional matrix. The liberal view has placed great importance on these institutions for development. Even if state socialism could claim the viability of its alternative, it did not prove convincingly its efficiency.

Doesn't the spectacular rise of China refute this proposition? Obviously yes, if we consider the Chinese system socialist because of its unremitting adherence to Marxism-Leninism and its rigid keeping of party rule. The Chinese Party leadership had carefully studied the breakdown and disintegration of the Soviet-type system and the Soviet Union. Any opposition to the political system had been crushed in 1989 on Tian'anmen Square. Yet, China has opened a limited range for private initiative and market coordination, and it has opened its economy, again to a limited extent, for international competition. At the same time, the Chinese state controls the

commanding heights of the economy. The system resembles Lenin's New Economic Policy, which, however, lasted only for a few years and could not display its full potential. In China, the hybrid system has resulted in almost 50 years of incomparable welfare growth and changed the external situation of the country into a dominant world market player. Whether the mixed system can propel the Chinese economy to the technological front and establish it there will be one of the interesting puzzles of the future. The option to open the economy and to introduce private enterprise and the market was, in principle, accessible for Eastern Europe as well. However, reform discourses in the mid-1950s (Hungary, Poland, GDR) and the late 1960s (Czechoslovakia, Hungary, Poland) did not lead to consistent policy changes due to Soviet resistance and intervention and due to the fear at home that they might also encompass political changes. Soviet attempts to transformation (*perestrojka*) came much too late, and thus the collapse looked unavoidable.

7 A BRIEF OVERVIEW

The following 11 chapters shed light on specific aspects of growth and development in state socialist systems and in transformation. The approach is not strictly comparative. The main focus of research lies on East Germany, a country between two larger neighbors, Poland in the east and the Federal Republic in the west. The relation with both neighbors was strenuous. Being the most developed and productive economy in socialist Eastern Europe, the GDR displayed a certain sense of superiority in eastward direction, but, at the same time, the party leaders observed with apprehension the turbulent Polish developments: workers' unrest, student protests, *Solidarność*. Apart from the Cold War and the ideological schism, apparent lags in productivity and welfare caused a feeling of unfair historical disadvantage leading to confrontation and segregation in the opposite direction, toward West Germany. For many people in the East, however, West Germany seemed a far-off land of Cockaigne. Thus, Poland was able to afford a much more relaxed and realistic attitude. Comparing GDR development with the development of both neighbors reflects this ambivalent position. Dealing with East Germany almost automatically provokes East-West comparisons, since the starting conditions before or at the end of the war were more or less equal in both parts of the country. So, it was expected that catching-up would happen rather smoothly after the system change. This did not take place in every aspect, particularly not in

innovation. Socialist legacies may be the explanation. The Polish catching-up problem was different due to its different starting position.

Chapter 2 analyzes the postwar territorial and demographic changes in Poland, which are generally less known than congruent developments in the two Germanies. They have been used as a social laboratory for Soviet-inspired modernization. Chapter 3 tries to assess the importance of technical progress for economic growth in the GDR. Quantitative analysis allows to identify the determinants and obstacles to growth in the overall economy and industry. Chapter 4 compares the long-term development of regional innovation activity in East and West Germany, finding that innovation activity in East Germany recovered after German unification, but that the East-West difference became larger. Chapter 5 focuses on synthetic fiber plants in Guben (GDR) and Gorzów (Poland). Both plants were subject to central planning and exhibited fast output growth mainly relying on Western technology imports to keep pace with international standards. In the transformation period, both plants were forced to significantly reduce their workforce and product range but managed to survive. In general, the development of both plants exhibits considerable similarities. Chapter 6 deals with the failure to benefit from the international division of labor. Core issues are the institutional set-up of foreign trade, the importance of efficiency criteria based on comparative advantage, pricing problems, and the almost inscrutable details of foreign trade statistics. Chapter 7 shows the persistence of family firms and the cautious privatization moves of the Polish government in the 1970s, a period in which the East German Party abolished the last privately owned family firms.

Cold war, ideological delusions, and autarkic tendencies have led to an East-West divide, which became nowhere more extreme as in the case of the two Germanies (unless maybe in the two Koreas). The trend to isolationism and seclusion inhibited the international exchange of goods and knowledge. As a consequence, GDR scholars, engineers, and economic leaders suffered from a limited access to productivity-enhancing information and advanced technology. Such barriers were removed immediately after the breakdown of the state socialist system. The next five chapters analyze how fast integration helped to change attitudes and behaviors as well as to fill gaps in knowledge.

Chapter 8 shows how the removal of political constraints after the unification improved the working conditions of East German researchers. While the transitory period in the 1990s caused high job insecurity, those who remained were able to catch-up and became fully integrated in their

scientific community. Chapter 9 extends transformation analysis to the socialist elites in general. It compares the professional background of office holders after 1990 in East Germany and Poland. What are their qualifications, and which positions did they occupy in the socialist period? How did they fare in transition? Chapter 10 demonstrates that the entrepreneurial habitus lay dormant under socialism and was resuscitated after the reunification. The transformation has changed the rules of the game and opened new productive opportunities for entrepreneurial talent, which, under the old regime, could be deployed only in a kind of rent-seeking: securing material supply or lobbying for a soft plan, for instance. Chapter 11 shows how the more liberal attitude to professional and scientific exchange with the West in Poland, in contrast to East German isolationism, helped its transition. The party enabled the elite to acquire from abroad knowledge about new production and organization techniques, cutting-edge science, and social capital. Chapter 12 extends this analysis, looking at entrepreneurs in East Germany being confronted with the big challenge to operate these enterprises in a capitalist system. Set free from social and legal restrictions, the entrepreneurial habitus takes up family traditions or unfolds spontaneously, leading to the economic success of newly established firms.

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CHAPTER 2

From East to West. Modernization in the Western and Northern Territories of Poland (1944–1989)

Konrad Walerski

I INTRODUCTION

Collective awareness of present-day Polish society perceives Poland as a quite uniform country with respect to culture, language, nationality, and religion. From a historical and sociological perspective, this is, however, a relatively recent phenomenon existing for less than 80 years.¹ The idea of complex harmonization² within the concept of the modern national state

¹Within the whole of Polish history, only the short period from 1945 until today was characterized by continuity rather than by ruptures in national and cultural development.

²The idea of a unified state in terms of nationality, language, and religion in the case of postwar Poland was to contribute to the elimination of ethnic conflicts and be the opposite of the Second Polish Republic, torn apart by internal contradictions, and to improve the construction of socialism (Kersten 1993, 30–41).

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had been propagated by the political camp of national democrats when Poland regained its independence after World War I (Koryś 2006). Its later implementation took place under different historical conditions and under the influence of a political group with completely different values — the Polish Workers' Party. Realizing this idea was the consequence of the agreements concluded at Jalta and Potsdam at the end of World War II. Their provisions shaped the development of Polish statehood on a new territorial and social basis. The imposed communist government of Poland took over eastern parts of the German Reich, while the Soviet Union annexed eastern provinces of Poland. This led to a massive exodus of the German population from the new Western and Northern Polish Territories and the relocation of Poles from their homelands in the East (Musiał 2011, 206–207; Kochanowski 2016, 35).

These events had serious consequences for the later socioeconomic development of the People's Republic of Poland (PRP). Spatial mobility of masses of people, their dissociation from their traditional place of residence, from their domestic culture and history, and from their class and family relations, became an important element of the wide-ranging and revolutionary reform program of the communist party. Its supporters called for the reconstruction of villages and cities, industries, and administration, as well as for the transformation of the political, social, and economic relations, which should lead in the end to the emergence of a modern socialist state. This process implied the realization of the Soviet concept of state socialism and the method of central planning (Jarosz 2013). The socialist (or better: "Soviet-inspired") modernization aimed at civilizational progress and meeting the needs of a Poland that had gravely been wrecked during the war. It was necessary to speed up industrialization and urbanization, to reorganize the traditional agrarian sector, and to expand education and social policy.

The mentioned processes of modernization proceeded with particular intensity in the former German regions, which had been "regained" in 1945 by the new Polish state. The new "social laboratory" of Poland was marked by different social phenomena: intensified migration, settlement and integration, problems with coexistence of new settlers and local people, social mobility of new settlers and their integration into the new Polish "socialist society," and the integration of the new territories into the rest of the country. Such cases attracted very soon the attention of Polish sociologists, mainly from the school of Florian Znaniecki, who found in the "regained lands" a suitable area for sociological research. Today, their

analyses and studies testify to the achievements and impediments of socialist modernization in the PRP. They show the analytic, documentary, and policy-oriented role of Polish sociology in the period of state socialism.

This chapter will discuss three fundamental problems: (1) concept of socialist modernization as model of socioeconomic development, (2) the historical conditionality of this development in the “regained territories,” and (3) the contribution of Polish sociology to the discussion of the challenges of socialist modernization in these areas.

2 THE CONCEPT OF SOCIALIST MODERNIZATION

Modernization may be looked at from a historical or sociological point of view. In the first case, it is a complex process of *longue durée* entailing social, political, economic, cultural, and mental changes within Western civilization, which reached its climax during the nineteenth and twentieth centuries³ (Sztompka 2005, 130). Modernization is also a theory of social change and a research instrument allowing sociologists to describe, analyze, and explain the transition of societies from tradition and backwardness to modernity (Krzysztofek and Ziemilski 1993, 6).

Yet what do we understand by modernity? As a rule, it is defined as a historical epoch initiated by enlightenment ideas adopted by the American and French revolutions, the industrial revolution in England, and, finally, the proletarian revolution (Musiał 2013, 33). Shmuel N. Eisenstadt tried to identify the multiple causes of social change and concluded: “The idea of multiple modernities presumes that the best way to understand the contemporary world — indeed to explain the history of modernity — is to see it as a story of continual constitution and reconstitution of a multiplicity of cultural programs” (Eisenstadt 2000, 2). According to this definition, there are many forms of modernity, among which we may discern the Soviet inspired or socialist type from the Western type.⁴ The

³Modernization roots in ideas of West-European civilization that crystallized from Christian ethics, Roman legal and republican understanding, and Greek philosophy (Libicki 2019, 72–79). In the course of Europe’s expansion, it captured with different intensity the colonies of European states, in particular the US. As a consequence, additional features of Western civilization were added to the leading development model: new communication channels, technology, industrialization, urbanization, population growth, migration, science, mass culture, emergence of a national, political, and class conscience, universal suffrage, the welfare state, and imperialism (Davies 2010b, 1301; Parsons 2009, 96–109).

⁴The two models can be seen as liberal and collectivist forms of modernity (see Chap. 1).

Soviet-inspired variety, however, is also rooted in Western social thinking (Suchanek 1999). Similar views about pluralist social systems and their development are to be found in Wallerstein's "World Systems Theory" (Wallerstein 2007, 32–3) or Feliks Konecny's "Theory of Multiple Civilizations" (Konecny 1935, 1997).

Modernization can further be understood by the "Theory of Dependent Development." It may unfold on the basis of a dependency relation between a peripheral state and a center of progress. This describes, for instance, the relation between Poland and the Soviet Union (Szczepański 1985, 16–17). As Sztompka (2002, 508) underlined, modernization is "an intended, targeted, planned process (...) that approaches an acknowledged model of modernity, as a rule a model of an existing society considered as modern." Yet, modernization is more than a sociological theory. It is a specified model of development imitating a good example, or it is a revolutionary reform program of an underdeveloped country. It may put the principles of a given ideology into practice as Marxism-Leninism attempted after the Russian revolution to modernize the Soviet Union and, after World War II, also its satellites in Eastern Europe (Križan 1991).

The Western and socialist processes of modernization show different properties. The first model features competitive democracy, market economy, welfare state, and mass consumption (Zapf 1990, 17). Talcott Parsons, representative of a functionalist modernization theory, characterized modern societies by secularization and enlightenment, industrialization, mass production, rationalization, autonomy of social subsystems, individualism, urbanization, and literacy (Parsons 2009). The second model is autocratic and distinguishes itself mainly by central planning, collectivization of agriculture, industrialization with a preference for heavy industry, political terror, strengthening of the military, ideological combat, and the psychological concept of the new man (Davies 2010b, 1021–25). This differentiation shows the complexity of Poland's socioeconomic development after 1945 and the tensions between the communist elite and the majority of society — not only in the "old" Poland but also of those people with a peasant background who have been relocated in the new Northern and Western Territories. Both models feature, however, some common traits of socioeconomic development.

I shall demonstrate the functioning of such systems of common modernization features in the PRP using a general model of socialist modernization (Fig. 2.1). The model distinguishes two fundamental modernization aims characterized by nine indicators of socioeconomic development. The

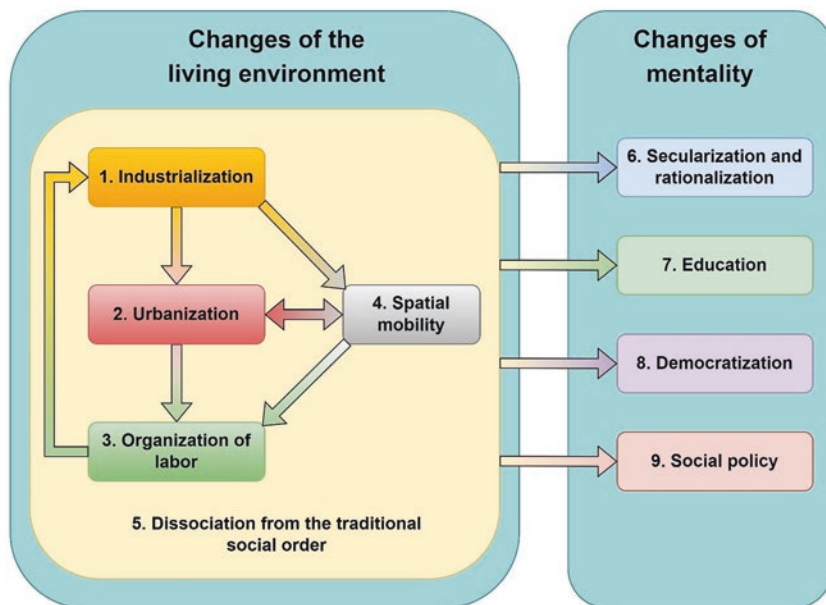


Fig. 2.1 Model of socialist modernization in the Polish People's Republic. Source: Own design

first aim is the change of the living environment concerning the physical transformation of all aspects of the environment in which the social and economic life is taking place. It consists of four individual indicators (1–4) and an integrating indicator (5):

1. Accelerated industrialization is the most important basis of modernization. It has far-reaching social, economic, and political-ideological consequences: central planning, set-up and expansion of industrial structures, a class system with a growing workers' class and a technical-intellectual elite, development of science and technology, growth of infrastructure and construction, overcoming civilizational backwardness, improvement of the quality of life, military strength (Kostrowicka 1978, 172–3), establishing and legitimizing political power, rapid economic growth, import of knowledge, hampering individual initiative in industry, and lack of private capital (Križan 1991, 80).

2. The consequence of industrialization is urbanization and the development of new urban centers around emerging industrial plants, which attract masses of people often from rural areas.
3. The result of industrialization and urbanization is, after all, an increase in jobs and reduction in unemployment. Under Marxism-Leninism, labor was the core element of socioeconomic development, and the socialist firm was the center of new social relationships.
4. Within all three processes, spatial mobility of the population takes place — that is, migration from the countryside to the cities and to new urban centers and regions of the country. It is the common driver for the three preceding indicators because, during the period of resettlement, it regulated the amount of human resources needed for work in industry, for settlement in cities, and for the expansion of the workforce or administration.
5. Dissociation from the traditional social order — the common motive for all modernization processes which have together decisive influence upon the change or dissolution of the initial cultural, religious, and traditional order. It consists, for example, in retrenchment of traditional agriculture or restriction of rural overpopulation.

The second aim comprises changes of mentality. It concerns the transformation of the axiological basis, attitudes, and thought patterns through the influence of changes in the living environment (6–9):

6. Secularization and rationalization — both activities in the context of modernization mean separating the religious sphere from other areas of life, such as politics, science, or culture, and replacing it with the expansion of bureaucracy and economic policy, in order to accelerate the economic growth.
7. Democratization — the postulate of social equality, which in the political sphere was only a propaganda slogan.
8. Education aimed at eliminating illiteracy and, in higher education, training staff for the research, administrative, and industrial sectors.
9. Social policy in the form of guaranteeing access to public services, such as free healthcare, social security, and organizations of leisure.

From the point of view of the socialist modernization model, the mentioned features may be seen as particular articulation and competing alternative to the Western path on the way to modernity (Zysiak 2017, 139).

Starting point for analyzing modernization in the Western and Northern Territories of the PRP is the spatial mobility of the population. This process characterizes the social transition from backwardness and tradition to modernity. It also contributes to the dynamics of social change, creating new forms of behavior, needs, and structures resulting in demographic and cultural transformation. In addition, spatial mobility propels industrialization, urbanization, and reorganization of labor and speeds up their pace. The following paragraph will deal with the historical conditions and consequences of spatial mobility and their perception by Polish sociology.

3 HISTORICAL CONDITIONS AND CONSEQUENCES OF SPATIAL MOBILITY IN THE “REGAINED TERRITORIES”

Socialist modernization of Poland was a direct result of applying Soviet policy in postwar Poland. Only for a lesser part, it resumed Polish concepts of modernization of the interbellum (Koryś 2006; Musiał 2013, 105–163). After the German surrender in 1945, the political aims of Moscow focused on reorganizing the geopolitical order in Central and Eastern Europe, on enhancing the ideological influence of state socialism in the conquered countries, on pushing back the Germans behind the Oder river, and on extending the USSR on Polish territories. This was meant to overcome national and ethnic conflicts in future Europe. To this end, the victorious powers decided to carry out mass relocations of the population of different nations. Such plans were accepted by the US and the UK at the conferences of Teheran (November/December 1943), Jalta (February 1945), and Potsdam (July/August 1945) since they wanted to avoid conflicts with the USSR (Oseka 2016, 23).⁵

For Poland, these provisions implied the dominance of Soviet policy over decisions of the Polish government in exile, which had been transferred to London during the war. Thus started a new “peaceful” occupation of Poland, which, in fact, meant again the loss of political independence for 45 years. Nevertheless, the Polish state resumed its activity in the years 1944–1945. Political power was assumed by a communist government under the influence of the Soviet Union. All visions of socioeconomic development of Poland were subordinated to Moscow, in particular the primacy of Marxist-Leninist ideology and the system of state socialism (Musiał 2011, 206–240). Western development programs, like the

⁵In fact, their origins go back to the Hitler-Stalin Pact of August 1939.

Marshall Plan, were declined by the “new Poland” (Szatlach 2014, 337). The first step toward transferring Soviet into Polish policy was the publication of the propaganda reform program, the PKWN⁶ manifesto. The second document was the Six Years Plan stressing the development of industry in Poland. The third document crowning the foundation of the Polish People’s Republic was the constitution of 1952. All three of them can be seen as modernization programs determining the main features of Polish development until 1989.

The transformation of the Polish state after World War II affected not only the political-ideological but also the physical sphere. In 1945 started the process of a geographical and cultural westward dislocation by about 200 km. Parts of German territories (Pomerania, Danzig, Neumark, Lower and parts of Upper Silesia, and parts of Eastern Prussia) were included into the Polish state. Simultaneously, seven eastern Voivodeships of Poland (Wilno, Nowogródek, a part of Białystok, Polesie, Wolhynia, Lwów, Stanisławów, and Tarnopol) were annexed by the USSR. In the West, the new borders were fixed by the Oder-Neisse line. In the East, Stalin implemented the old demarcation of the Polish eastern border by Lord Curzon and Sergei Sazonov (Davies 2010a, 960–961, 968). After 25 years, the dictator had achieved the aims of Russian policy during World War I and the Polish-Soviet War (1919–1921). It was decided, however, that Poland could preserve its autonomy and would not become a Soviet republic.

Figure 2.2 shows the geographical changes of Poland. Only half of the territory of the second Polish republic is situated within the borders of the PRP. The new state comprised only four-fifths of the area of its predecessor: 312,688 km² instead of former 389,720 km². In other words, the lost area (178,220 km²) was considerably larger than the gained area (101,200 km²) (Davies 2010a, 949–50).

The decision to move German and Polish borders threatened to expand German-Polish antagonism. It could lead to enhanced conflicts and tensions what was to be eschewed after the end of the war. The Soviet policy aimed at pushing back the German influence as far as possible to the West. Soviet propaganda underlined the weakening of the German state, in particular those parts that had strongly supported the Nazi regime. On the other hand, it strived for an ethnic unification of the territories on both sides of the Curzon line to avoid potential ethnical conflicts between Poles, Ukrainians, Byelorussians, and Lithuanians (Kochanowski 2016, 35).

⁶ Polski Komitet Wyzwolenia Narodowego (The Polish Committee of National Liberation).



Source: Own design

Fig. 2.2 Translation of Polish and German borders in 1945

The new borders and the motive of ethnic homogenization led ultimately to the expulsion and deportation of the Polish population from the eastern provinces into former German territories and the simultaneous displacement of the Germans (Davies 2010a, 968). According to Polish sources, a total of 3, 2 million Germans⁷ were expelled from the territories awarded to Poland in the years 1945–1950 (Osękowski 1994, 106). Thus, an unprecedented ethnic change took place. According to Jerzy Kochanowski (2016, 37), around 520,000 Ukrainians, Byelorussians, and Lithuanians had left the “new Poland” by August 1946. The Polish

⁷This number is given by most Polish sources. It differs from German sources, which show ca. 8,252,000 displaced persons (<https://de.statista.com/statistik/daten/studie/1060100/umfrage/zahl-der-vertriebenen-deutschen-nach-herkunft/>, 23.03.2023). The difference may be explained by the way of displacement, that is, either flight in the last weeks of the war or forceful expulsion immediately after the war.

Table 2.1 Number of displaced Poles from the eastern provinces

	<i>From</i>	<i>1944–1948</i>	<i>1955–1959</i>	<i>Total</i>
Into the “Regained Territories”	Lithuanian SSR	197,156	46,552	243,708
	Byelorussian SSR	274,163	100,630	374,793
	Ukrainian SSR	787,674	76,059	863,773
Common migration into the “Regained Territories”	Germany	965,000	–	965,000
	Central Poland	2,900,000	–	2,900,000
Total		5,120,993	223,241	5,344,234
Into Central Poland	USSR	258,990	22,260	281,250
	Germany	700,000	–	700,000
	Other foreign countries	506,000	–	506,000
Total		1,465,990	22,260	1,487,250

Sources: Kochanowski (2016, 37), Sienkiewicz et al. (2018, 474–475)

(and partly Jewish) population was forcibly resettled from the eastern territories in two waves: the first “repatriation” in 1944–1948 (1,258,993 people), and the second “repatriation” in 1955–1959 (223,241 people). People from central Poland, prisoners from concentration camps, forced laborers, soldiers, and Polish refugees returning from West Germany settled on the former German territory. A total of 5,120,993 people settled there by the end of 1948 (Sienkiewicz et al. 2018, 474–475). In addition, about 1.5 million people from the USSR, East Germany, and other foreign countries returned to Central Poland. These rates are shown in Table 2.1.

The propaganda of the communist government declared the expulsion of the Polish population from half of the Polish state annexed by the USSR as “repatriation” or “return to the homeland.” In fact, it was the eviction of an autochthonous population that had lived there for centuries (Eberhardt 2000, 49).

This exchange of territories and population engendered enormous modernization effects. For the second Polish republic, the eastern territories were of mythical importance as symbol of the former glory of the first republic and the Jagiellonian times of nobility democracy with its multicultural character and a special form of patriotism. On the other hand, the eastern lands stood out by a low level of social and

economic development. Forty-six percent of the second republic's area were inhabited by one-third of its population: 4,3 million. Ukrainians, 3,5 million Poles, 0,9 million Byelorussians, 1 million Jews, 0,4 million others (Lithuanians, Tatars, Karaites, Germans), and 2 million indigenous people (in Polish so-called *tutejsi*) (Mędrzecki 2015, 65). Most of them lived in rural areas and were occupied in agriculture. Among the Poles, there was the landed gentry, the intelligentsia, and the "settlers" (*osadnicy*) from central Poland executing administrative functions (civil servants, military, police, teachers, but also peasants). Social, national, and religious cleavages became a source of internal tensions. The bulk of the population remained in the premodern era. Despite sizeable investment, these territories were marked by civilizational backwardness, an autarkic economy, and lacking infrastructure (Oseka 2016, 17).

In the PRP, the eastern territories became a taboo. People born there were registered as born in the USSR. The lands annexed from Germany were glorified by the communist government. In order to legitimize the change of borders, to gain the favor of the transferred population and the rest of society, and to familiarize them with the reality of a new cultural environment, the new Polish government created the term "regained territories" (*ziemie odzyskane*), referring to the medieval period of the Piast dynasty when these lands were situated within the borders of the Kingdom of Poland. The recourse to the historical argument was meant by the communists to legitimize the "returns" of these territories into the homeland and acquaint the new population with the erstwhile home country (Eberhardt 2018). After 1956, the new territories were called "Western and Northern Territories."

Before the war, Polishness had little influence in the history and economic and cultural life of these regions. In 1939, 8,8 million people were living there, among them 7.1 million Germans and 1.3 million Poles (mostly in Upper Silesia, "autochthonous population"). In addition, military operations and the invasion of the Red Army caused the destruction of big German cities like Breslau, Stettin, and Danzig. Thus, the territories were a "blank sheet," which enabled the policy of Polonization (Osekowski 1994, 107–110).

The organization of Polish social, political, and cultural life in the "regained territories" started with the set-up of new institutions for

administration and science.⁸ The task of these institutions consisted of supporting and organizing the settlement policy and of collecting material on the mechanisms of the operation. The Scientific Council for the Problems of the Regained Territories counted eminent scholars among its members⁹ (Markiewicz 2005; Czubiński 1998, 113–114).

The catastrophic losses and damages of World War II, the new rulers, the change of borders, and the relocation of population had deep effects upon social change in the whole country. The census of February 1946 revealed that the Polish population had fallen since 1939 by one-third to only 23.9 million inhabitants. The population density dropped from 89,8 to 76,4 inhabitants per km². Only a small percentage of the population lived in the same place as before 1939 (Davies 2010a, 951). The population exchange took place not only in the new territories. Similar processes happened also in Warsaw, which had to be reconstructed or newly built and settled after 1945.

The war had caused deep structural changes in Polish society. The intelligentsia had been decimated, and the landed gentry and the community of Polish Jews practically ceased to exist. Social advancement (mainly the rural population) was followed by the social decline of other social classes. There was no way back to the organization of political, economic, and cultural life of the interbellum. The propaganda encouraged people to settle in the new Polish territory (Fig. 2.3). The Ukrainian, German, Byelorussian, and Lithuanian minorities disappeared almost entirely. Poland also lost the cultural center in the eastern provinces with the two university cities of Wilna and Lemberg. Because of the relocation, the Polish-speaking and Roman-Catholic population gained an absolute

⁸To be mentioned are the State Administration for Repatriation (Państwowy Urząd Repatriacyjny), the Ministry of Regained Territories (Ministerstwo Ziem Odzyskanych), the Commission for the Establishment of Place Names (pol. Komisja Ustalenia Nazw Miejscowych), the Society for the Development of the Western Territories (Towarzystwo Rozwoju Ziem Zachodnich), the Bureau for the Study of Settlement and Relocation (Biuro Studiów Osadniczo-Przesiedleńczych), the Scientific Council for the Problems of the Regained Territories (Rada Naukowa dla Zagadnień Ziem Odzyskanych), the Western Institute in Poznań (Instytut Zachodni w Poznaniu), the Sociological Institute of the University Wrocław, and research centers in Katowice, Opole, Gdańsk, Szczecin, Koszalin, Słupsk, and Zielona Góra.

⁹Among others, Franciszek Bujak (historian), Jan Czekanowski (anthropologist, ethnologist), Adam Krzyżanowski (economist), Tadeusz Lehr-Splawiński (linguist), Eugeniusz Romer (geographer, cartographer), Władysław Szafer (botanist, ecologist), Wincenty Styś (lawyer, economist), and Rajmund Bułowski (statistician).



Fig. 2.3 Example of a propaganda poster: “The Regained Territories. Future of Poland. The Democratic Bloc has won them and shall keep them” (Edmund John). Source: Skoczek (2015, 43)

majority. The Polish People’s Republic, thus, became the first homogeneous national state in the history of the country.

Despite all the losses, Poland was also to benefit from the new political and territorial order. The “Regained Territories” had a better industrial infrastructure and more resources (coal, iron ore, industrial structures, a modern rail and road network, and a number of cities and sea ports). The provinces annexed by the USSR were predominantly less developed agrarian areas (the so-called B-Poland). The incorporation of Silesia and Pomerania enhanced the chances of industrialization and modernization of the economy. The new borders showed a certain coherence with mountain ranges (Sudetes and Carpathian), the Baltic, and large rivers (Oder and Bug).

4 THE CONTRIBUTION OF THE SOCIOLOGY OF THE WESTERN AND NORTHERN TERRITORIES TO ANALYZING ACHIEVEMENTS AND FAILURES OF SOCIALIST MODERNIZATION

The relocation of Poles into the “Regained Territories” created a prolific “laboratory of social processes,” which proceeded there more intensively than in the “old” parts of Poland. Sociology could play a special role in the documentation and analysis of settlement activity, finding there a wide field for empirical research. Sociology was a special discipline in the PRP since it could refer to its excellent methodological and intellectual roots and bourgeois traditions from the interbellum period. On the other hand, it experienced directly an ideological turn by the introduction of Marxism-Leninism and was confronted with the political, economic, and social crises of the PRP (Walerski 2022).

The leading sociological scholars from Kraków, Warsaw, and Poznań participated actively in the organization of new scientific centers in the new regions. Kazimierz Dobrowolski and Paweł Rybicki, both from the Scientific Council for the Problems of the Regained Territories, initiated research on different concepts of rural settlement and the organization of neighborhood groups, communal groups of settlers, and social institutions guiding urban settlement (Kwilecki 1968a, 305). Such projects were decided at the first meeting of the Council in 1945. The plans envisaged to relocate “compact population groups being able to keep up old social relations which would facilitate adaptation and integration into a new living environment” (Ziółkowski 1962, 265).

This strong engagement of sociologists in the new territories resulted in a sociology of the Western and Northern Territories. Of course, it was unique for Poland. As a new subdiscipline, it aimed at research on the social consequences of internal and external spatial mobility mainly in the form of relocation of parts of the Polish population. In some ways, it could be compared with sociological field studies on national minorities in the eastern provinces in the interbellum period.

Andrzej Kwilecki explained that migration was an important element of the socialist revolution in the PRP, since migration neutralized the

political reforms that Polish society would never have accepted: “the fact that it was possible on 1/3 of the state territory, i.e., in the newly settled Western regions, to organize deliberately society, the ownership system, the land reallocation etc. was beyond any doubt of great importance for the reconstruction of the socio-economic system in the whole country” (Kwilecki 1976, 99).

Historically, Polish sociology experienced two development phases. Between 1945 and 1949, empirical research was resumed, and the first chair of sociology was established at the University of Wrocław. However, under Stalinism (1949–1956), sociology was regarded as a “bourgeois science,” and it was removed as subject of study from the university curricula. Party sociologist Adam Schaff criticized the school of Znaniecki. The thaw of 1956 entailed a renaissance together with an extraordinary upswing of the sociology of the Western and Northern Territories. The 1960s and 1970s saw the golden age of Polish sociology (Walerski 2022; Kwaśniewicz 1995, 39–67) characterized by praxeology.¹⁰ The number of research institutes, scholars, and publications grew. The bibliography on social problems of the Western and Northern Territories (till 1965) compiled by Andrzej Kwilecki (1967) counted some 400 contributions.

The institutional organization of sociological research in the “Regained Territories” suffered from difficult material and personal conditions. In the beginning, the discipline was situated mainly in academic centers outside of the region. Chairs at the universities of Warsaw, Kraków, Poznań, and Wrocław had a section on the sociology of the Western and Northern Territories (Kwilecki 1968a, 309). Only in the 1960s, new research centers were set up in other Polish cities (Katowice, Opole, Gdańsk, Szczecin, Koszalin, Słupsk, and Zielona Góra) in order to support the social development of these regions and the scientific development of sociology (Dulczewski 1967). An important role was played by associations like the Society for the Development of the Western Regions (Towarzystwo Rozwoju Ziemi Zachodnich, 1957–1971) and by state institutes¹¹ (Kwilecki 1968a, 309; Sakson 1987, 105). A leading position was taken up by the Western Institute at Poznań (Instytut Zachodni). Its department

¹⁰It was a scientific methodology developed by the philosopher Tadeusz Kotarbiński, which sought explanations of methods in many different domains of action (Hiż 1954, 238).

¹¹Institute of Sociology and Cultural History of the Polish Academy of Sciences (PAN), Silesian Institute in Opole, Institute of Sociological Research of the PAN, Center of Opinion Research at the Polish Broadcast, Institute of History of the PAN, Polish Institute of Ethnology at Poznań.

of sociology coordinated research in the whole region. Its staff functioned as advisor and head of research teams responsible for the long-term planning in these territories (Kwilecki 1968a, 309–310). In fact, the institute was highly politicized since it was designated to legitimize the Polish claims to the Western and Northern Territories. Over the years, these centers contributed to the study of industrialization, demography, social mobility, cultural change in the countryside, and the social impact of schools.

New centers for the study of external spatial mobility were set up in the 1970s: the Committee for Poles Abroad (Komitet Badań Polonii) at the PAN headed by Hieronim Kubiak from the Jagiellonian University Kraków, and the Institute for the Research on Poles Abroad (Instytut Badań nad Polonią) at the Catholic University Lublin. Only after 1989, the latter institute addressed the problems of Poles in the East, which were obstructed in the communist period for ideological reasons (Horoltes et al. 2019, 11–12). In 1973, the PAN set up an Institute for the Study of Poles Abroad at Poznań (Zakład Badań nad Polonią Zagraniczną) (Sakson 1987, 111).

The sound institutional foundation of Polish sociology contributed to establishing interdisciplinary networks of scholars (demographers, ethnographers, legal experts for international law, linguists, geographers, and above all historians and sociological scholars) in the Western and Northern Territories.

Polish sociology stood under the influence of the empirical methodology and humanistic approach of Florian Znaniecki.¹² His student Zygmunt Dulczewski (1916–2004) used the autobiographical method and extended it by the idea of organizing competitions for diaries of the inhabitants of the Western and Northern Territories. The climate of the political change in October 1956 caused a broad social resonance for this idea. Representatives of all professional groups, women and men, town and village people, former autochthonous inhabitants, “repatriates,” remigrants

¹²Florian Znaniecki (1882–1958) is the founder of academic sociology in Poland. In 1920, he established a chair, and in 1921, an institute for sociology at the University of Poznań. His school became known for its empirical approach and its humanistic inductive theory relying on (auto-)biographical methods. From 1914 to 1920, he collaborated with William I. Thomas (1863–1947) in Chicago and New York. The year 1920 saw him back in Poland, which, after several stays in the US, he finally left in 1939. His empirical approach was widely accepted internationally, which makes him the most influential Polish sociologist.

from abroad, pioneers of settlement, and settlers from the central regions of Poland participated in these competitions. At the initiative of Dulczewski, the Western Institute organized (1956) the first competition on the memories of settlers—the diary of the settler of the regained territories (*Pamiętnik osadnika Ziemi Odzyskanych*) (Dulczewski and Kwilecki 1963). Ten years later (1966), the Western Institute announced a second competition on the memories of young people who were born there (Dulczewski 1968). Until the end of the 1960s, there have been (also by other scientific institutes) about 70 diary competitions organized for the local population, settlers, and the youth in many towns and villages in the “regained territories.” They mostly had been announced for the 15th and 20th anniversary of the “return” of these regions to Poland (Kwilecki 1968a, 308–309; Sakson 1987, 107). In 1961, Dulczewski’s research team at the Western Institute in Poznań published a collective volume describing the emergence of a new society (Dulczewski 1961).¹³ In the same year, Dulczewski began a series of publications in the field of sociology of the Western and Northern Territories titled: *Western Territories. Studies and Materials*. As part of this publication series, 13 works by outstanding Polish sociologists have been published.¹⁴ Ten years later (1971), this collective work was repeated (Dulczewski 1971, see also Sakson 1987, 109, 111).¹⁵

¹³The volume contains the following contributions, which are characteristic of the type of research: Zygmunt Dulczewski, Autochthonization of the population in the Western Territories; Bożena Chmielewska, Formation of the socio-demographic structure of villages in the Western Territories in the years 1945–1959—the example of the villages Łęgowo and Głuchowo; Józef Konieczny, Foundation of a new community on the ruins of the city (Kostrzyń nad Odrą); Kazimierz Żygulski, From the study of adaptation processes and social integration of returnees (Gubin); Andrzej Kwilecki, The group of Lemkos in the Western Territories (a sociological sketch).

¹⁴Stefan Nowakowski, Adaptation of the population in Opole-Silesia, 1957, Social changes in the Opole village, 1960; Andrzej Kwilecki, The Social Role of the Teacher in the Western Territories in the Light of the Diaries of the Teacher-Settlers, 1960; Kazimierz Żygulski, Repatriates in the Western Territories. Sociological study, 1962; Ludwik Janiszewski, Deep-sea fishermen. Sociological study, 1967; Władysław Markiewicz and Paweł Rybicki, Social Changes in the Western Territories, 1967.

¹⁵This volume contains the following contributions conveying a representative picture of the work done: Zygmunt Dulczewski, Comparative sociological study on the Lebus lands; Pszczew, Processes of autochthonization of the population; Józef Burszta, The Lebus village. From the studies on the villages Głuchowo and Łęgowo; Franciszek Krzykała, From the study of social change and the formation of local and regional ties among the inhabitants of Kostrzyń nad Odrą; Kazimierz Żygulski, Former repatriates in the province Zielona Góra; Andrzej Brenz, The Lebus lands in sociological literature (1945–1970).

As said, Dulczewski applied the autobiographical method in the tradition of Znaniecki from the interbellum period. In 1965, the Wrocław section of the Sociological Society, together with the Society of fans of Wrocław, issued a survey questionnaire: “What means Wrocław for you?” This questionnaire was connected to a similar survey of 1929 in Poznań initiated by Znaniecki and was repeated by the chair of sociology of the University of Poznań in 1964. The aim of the Wrocław survey was to gain material about the formation of a compact city community from a population with different regional origins (Kwilecki 1968a, 309).

The 25th anniversary of the “return” of the Western and Northern Territories in 1970 saw a new competition of the Western Institute aiming at different social problems: professional labor, family life, living and neighborhood relations, plans for the future, leisure and culture, views and interests concerning the city, the region, and the country, but also concerning different political events and the education of young people (Sakson 1987, 108). Thus, sociologists tried to obtain an exact picture of the last 15 years of socioeconomic development. In the 1970s and 1980s, more studies of valuable biographical material were published, enabling research of social development in this part of the country.¹⁶

The competitions also served the aim to enhance the identification of the displaced persons with the new region. The sociologists were looking for advantages and positive attitudes instead of critical comments. They revealed optimism and fascination with the method of diary research. This may be seen as a barrier for science since it instrumentalized the memories for propaganda use.

Next to such traditional approaches, other methods were applied. Descriptive monographies dwelled on particular social phenomena like social stabilization, attitudes toward problems of the city, individual regional groups and places, and the development of culture. Reliable data were collected by surveys of the Center for Opinion Research of the Polish Broadcast in selected cities (Kwilecki 1968a, 308–309). In some places, sociologists conducted — individually or in teams—so-called intensive studies aiming at in-depth knowledge of the social environment of the

¹⁶Examples are: *The second generation. Memories of inhabitants of the Western and Northern Territories of Poland*, Poznań 1978; *My house on the Oder River. Diaries and memories*, Zielona Góra 1976; *Diaries of inhabitants of Lower Silesia*, Wrocław 1978; *Our country, Memories of inhabitants of Central Pomerania*, Poznań 1982; *The roots of the present. Diaries of inhabitants of the region Opole, Opole* 1986.

settlers, their way of thinking and behavior, and their political, social, and cultural interests. After 1956, the weekly and daily press also published field reports (Dulczewski 1958, 228–232).

Theoretically, the sociology of the Western and Northern Territories introduced West European and American concepts. Janusz Ziółkowski (1962, 269), for instance, analyzed the society of the new territories, using terms like “Americanization,” “cultural pluralism,” “social assimilation and integration,” and a cultural “give and take” in the process of adaptation. There were very little influences of Marxism-Leninism since this ideology did not fit well with the reality of social and cultural change in these regions.

In general, Polish sociology did not develop a new theory dealing with migration and relocation of Poles and Germans. Nevertheless, for more than 50 years, special paradigms evolved and found recognition in 2005 as “sociology of the Western and Northern Territories.” It reflected modernization in these areas. The concept of modernization did not show up, however, until the 1960s. All social and economic changes were described in terms of progress, entitlement, activity, evolution, intensification, repair, improvement, professionalization, politics, creativity, program, reconstruction, expansion, influence, or dependence (Kocik 1986, 13). Only in 1962, Janusz Ziółkowski referred in the context of social development in the “Regained Territories” to Raymond Aron’s (1959, 4) concept of social modernization:

The integration of the Western Territories into Poland was, among other things, so important because it enabled already in the first post-war years what the French sociologist R. Aron had called ‘social modernization’, which under the Polish (and not only Polish) conditions is equivalent to urbanization. Despite severe war damages, the housing potential of the urban centers in the Western Territories was big enough to accommodate the waves of newcomers from the village. In addition, it approached the pre-war level by systematic reconstruction. (Ziółkowski 1962, 280)

At the end of the 1960s, “modernization” was successfully introduced to rural sociology and social theory (Turski 1968; Turowski 1970; Bornus and Turowski 1970; Paluch 1976). Many of the phenomena and challenges of socioeconomic development in the new territories can be analyzed as manifestations of socialist modernization. The empirical material of the sociological studies contributed significantly to the understanding

of the modernization processes in these regions. The scholars observed with special interest the changes in the composition of the population concerning their origins. They distinguished Polish autochthonous people (Eastern Pomerania, Opole-Silesia, Masuria) from displaced persons (settlers, repatriates) and inhabitants of the former German-Polish border areas. The encounter of numerous regional groups differing in culture, language, way of life, national awareness, and so forth led to the rapprochement of autochthonous people and settlers and the emergence of new communities. In addition, one had to adapt to new living conditions (landscape, architecture, infrastructure, technology, industry, natural environment, cities). Observing the conditions of coexistence of different population groups and their conflicts furthered research on social integration: how do different groups merge and new social units evolve? How are cultural patterns aligned, regional barriers and isolation of different groups overcome? How can social ties be enhanced, mixed marriages made possible? And finally, how can different regional groups form a unified society? (Kwilecki 1968b; Żygulski 1962; Nowakowski 1963).

Conditions and consequences of the encounter of different ethnical and cultural groups set another research focus. The scholars were interested in cultural features, behavioral patterns, attitudes, traditions, customs, and views of resettled people. Problems of forming identity and national awareness got discussed as well as the “clash of cultures.” Migration played an important role for raising and deepening national awareness. According to Kwilecki (1976, 99), the settlers in the new regions were convinced of their “national mission.” This implied a connected life of workers and peasants and simultaneously the recognition of workers as natural allies of the village. Finally, migration influenced the integration of the national and the cultural space of Poles:

Migration allowed to get acquainted with the country, its centers, and its landscapes. It helped to break the isolation of traditional local communities and to confront and interpenetrate regional cultures, customs, and ways of life. It helped to increase the number of local or regional homes of individual displaced persons and families. This emotional tie of Poles to different regions is based or complemented in family contacts and in the dispersion of the families over different parts of the country. (...) Family ties were created between cities in different parts of the country, which became manifest in multiple forms of communication, in visits on occasion of marriages, funerals, holidays or visits to family cemeteries. By consequence, the territory of

the People's Republic of Poland within its new geographical and political borders is based upon completely new social relations, upon a sustainable system of social bonds and new connections between regions. It resulted from migration and an integrated cultural space combining old symbols and traditions, which represent different old centers and historical monuments, and newly installed symbols of modernity like big industrial structures, new residential areas, streets or, as of late, big tourist hotels. All these are symbols, which are linked to the mobility of people. (Kwilecki 1976, 100)

After a couple of years, in which the migration processes in the new territories slowed down, scholars could analyze the changes in the demographic structure. Janusz Ziółkowski found that the demographic change in the Western and Northern Territories was larger in the 1960s than before 1939. The new demographic structure showed an equilibrium between the sexes, a smaller population density than in the rest of Poland (73 as against 93 inhabitants per km²), and a higher degree of urbanization (55.8 percent of the urban population against 45.2 percent in the rest of the country). A high birth rate inaugurated a “new autochthonization” of the newborn generation. The “Regained Territories” displayed the highest population growth in Europe, a high share of people up to 15 years of age (39.4 percent), and a very high share of married women in the age group 15–29 years, which was 16 percent higher than in the rest of the country (Ziółkowski 1962, 257).

Already during the interbellum period, Polish sociology observed the migration from the village to town. In the context of modernization, urbanization meant social advancement of the settlers in the hierarchy of urban life (work and occupation, quality of life, education, social security, healthcare, etc.). Urbanization shifted the labor force from agricultural to non-agricultural occupations, and people could count on social advancement. Wrocław, the biggest city of the new territories, was settled by 40 percent rural population and by 41.2 percent of people from smaller towns (Kwilecki 1968a, 315).

Each geographical and historical region belonging after 1945 to the PRP was subjected to sociological analysis. The research focused upon the formation of large territorial communities as a result of migration. So, another new subdiscipline emerged—the sociology of the sea. Its scholars (Ludwik Janiszewski, Robert Woźniak, Bolesław Maroszek) studied the professional life of “people of the sea”: fishermen, seamen, and dock workers in the regions along the Baltic Sea, Szczecin, Koszalin, and Gdańsk

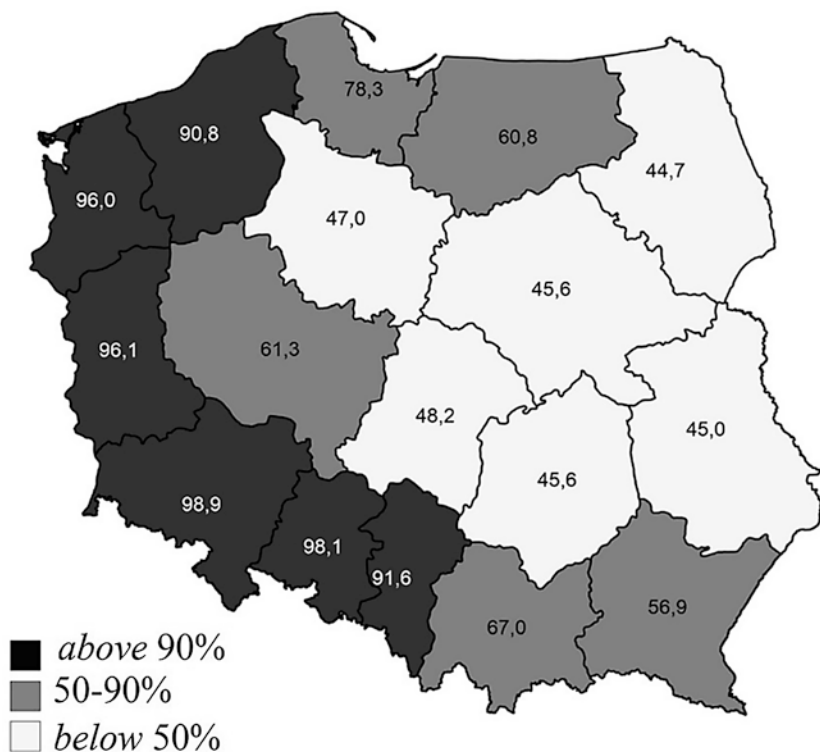
(Markiewicz 2005). The social changes in the large state farms (Państwowe Gospodarstwo Rolne, PGR) of the provinces of Koszalin and Olsztyn have also received much attention (Kwilecki 1968a, 312, 316).

The macro perspective was followed by the micro perspective, which analyzed different social patterns and social roles of the pioneers in the “Regained Territories”—that is, first settlers, administrative staff, organizers, activists, and newcomers. Because of their high social status and progressive role, these pioneers became the first “modern” citizens of the PRP. A highly motivated scientific community documented the achievements of socialist modernization in the respective regions. Their analyses testify to the “advantages of backwardness” of the local population. Urbanization, industrialization, communal equipment, and the rural infrastructure had a higher level than in their old places of residence (see Fig. 2.4), which could be put to productive use by the settlers.

However, sociological research also points to barriers of development and progress. A sizeable part of the settlers was not prepared to use the civilizational amenities of former German areas. They tolerated serious devastation of existing property. The focus on development problems of the new regions led to treating the lost Polish eastern provinces as a taboo. The change of social reality was performed by distancing the people from their natural environment and native culture. Such measures led to the disintegration of families and of social ties spreading over generations. The attempt to integrate people of different background, classes, and strata resulted at times in conflicts and antagonisms.

A couple of other socially caused modernization barriers may be enumerated: a strong bond of the population with their old cultural and social customs, mindless imitation of different behavior patterns, susceptibility to the influence of new ideologies, extravagant lifestyles and increasing competition for material goods, a low level of knowledge about cultural processes, destruction of the old culture of the settlers, primitive attitudes of the settlers with respect to the material culture of the household, industrialization without urbanization, overdrawn government investments, an excessive pace of development, and a sense of insecurity: until the ratification of the Treaty of Warsaw in 1970 between the PRP and West Germany, the Poles were anxious about the return of the Germans.

Mental blocks may have also resulted from political limitations of sociology. Many scholars consolidated the propaganda view of the historical and social reality, using concepts like “migration,” “repatriation,”



Source: Komorowski 2018, 88

Fig. 2.4 Electrification of the Polish village, 1960

or “Regained Territories” without considering the historical background. Janusz Ziółkowski, for instance, wrote repeatedly, conforming to the propaganda, about the “return” of the Western and Northern Territories to Poland. His writings show an anti-German bias, while he has no critical word about the Soviet Union. There is no integral textbook on the sociology of the western and northern regions, nor is there an overarching theory of Polish migration. Empirical research dominated theoretical thinking, which implied an unsatisfactory relation between science and politics.

The dynamic development of sociological research in the Western and Northern Territories came to an abrupt halt at the beginning of the 1970s.

Field research and the diary competitions, which according to Dulczewski should be repeated every ten years, were also discontinued. The political authorities declared the integration of the people residing in the new territories as completed. However, many specific problems of these regions were considered intractable because of political reasons (Sakson 1987, 109).

During the dawn of actual socialism and the period of transformation, the sociological center of Wrocław took up the studies on the Western and Northern Territories. The VII Polish Congress of Sociology in 1986 opened with a plenary session on the “Regained Territories” and the processes of integration (Misiak 1990). In 1988, a team of scholars from all over Poland studying problems of the local population convened at the Western Institute of Poznań. They collected data and conducted many field studies in places of ethnic or language communities of Silesia, Kashubia, Masuria, and Ermland, as well as among the German minority (Sakson 2017, 531).

5 CONCLUSION

A new Polish state was created after 1944. It was an unparalleled historical act to provide the “new Poland” with new borders and to endow the Polish society with a partly new identity. The effort implied a manipulated version of history, an authoritarian political system, a complex Soviet-inspired modernization policy, the glorification of a progressive class, that is, the proletariat, the propaganda of peace, and the victory of socialism over fascism. These changes laid a fertile ground for the development of a modernization path, which was new for Poland and which tried to combine idiosyncratic features of socioeconomic development with the general properties of the system. The Western and Northern Territories of Poland reflected these modernization processes.

Usually, socialist societies are characterized by a low level of mobility (mainly because they have closed their state borders). In contrast, Poland experienced intensified external and internal mobility and dislocation, which took place immediately after World War II. This created the conditions for introducing a new political and social system in Poland, which resulted in the transition to an industrial society. It established a solid foundation for the PRP and the Third Polish Republic.

The sociology of the Western and Northern Territories, in many respects, did not fit into the narrow structure of the prevalent ideology of Marxism-Leninism. Nevertheless, it provided stimuli to analyze social

stratification without regarding the symptoms of social differentiation solely from the class point of view. The most relevant social concepts employed by the sociologists of the Western and Northern Territories right from the beginning were “ethnic groups,” “regional-geographic communities,” “youth,” “men and women,” “individual pioneers,” or “family communities.” By their very nature, these concepts reflected the social facts to be analyzed (Markiewicz 2005).

Sociological research in the new territories yielded two contradictory views of socialist modernization. The first underlined a high intensity of modernization, openness, innovation, and entrepreneurship. The second drew attention to social uprooting and atomization of the people and a slow evolution of collective awareness (Sakson 2017, 530). Polish sociology had a rich theoretical and methodological background based on the empirical school of Florian Znaniecki and on strong American and West-European influences. In general, sociological research is not interested in ideologies, but in human beings, their subjectivity, and their real needs. Polish history demonstrated that the political leadership did not respect this principle. Political and economic ideas, arbitrary relocations of borders, enforced development, and historical propaganda became more important than the people, their culture, history, and memory. This resulted in a powerful modernization barrier.

The settlers and inhabitants of the new territories proved strength and activity, like the whole of Polish society, which succeeded in reconstructing the country from the devastations of the war and in building a strong nation. Only after the big turn of 1989, sociologists were able to observe objectively the real political and social cleavage between the “Regained Territories” and central Poland. After 1945, former central Poland became the new East, which did not fit to its mental and cultural reality.

The history of the new lands reflects a Polish drama after World War II. Only in 1990, Germany recognized these territories as part of the Polish state. The People’s Republic had occupied them under the protection of the USSR, which stationed their troops preferentially there. The Polish eastern territories and the remaining Poles there became entirely “depolonized” and “sovjetized”, what for several decennia became a taboo topic in public opinion.

The modernization of the Western and Northern Territories can be viewed only partly as a success. The stumbling block for the project was the very model of modernization based on authoritarianism and a wide range of problems that could not be solved along this development path.

A typical example is the low innovation intensity. It became most visible in the former state farms of the new lands, which, after they lost their government subsidies in transformation, were marked by poverty and backwardness.

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The Influence of Technical Progress on Economic Growth in the GDR

Udo Ludwig, Ann Hipp, and Kehinde Medase

I INTRODUCTION

Productivity is driven by technical progress, and technical progress can be achieved by the education, abilities, and qualifications of people, known as human capital (Foster and Rosenzweig 1996). Human capital can be created through schooling, training, and investments, and it contributes to the economy, which absorbs educated labor (Griliches 1997). Many empirical studies observe a positive relationship between human capital, technical progress, and productivity in market-based economies (e.g., Maudos et al. 2003; Henderson and Russell 2005; Teixeira and Fortuna 2010).

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Socialist economies, such as the German Democratic Republic (GDR), the Polish People's Republic, or the Czechoslovak Socialist Republic, were characterized by a high level of education and training of the population (Lavigne 1995). Despite this success, the socialist education system faced a large gap between aspiration and reality, and the political system failed in the end (Kaack 1993). The GDR was known as the wealthiest and most technologically sophisticated nation of the Eastern Bloc (Baker et al. 2007). The amount of its human capital in terms of qualifications and technical progress, especially in comparison to West Germany, should not be underestimated (Günther et al. 2020). Recent studies show that technical progress in the form of patents led to higher productivity of the industry sectors in the GDR (Hipp et al. 2022b). Nonetheless, empirical evidence on the effect of technical progress—based on the contribution of academic and skilled workers—on productivity in socialist economies is scarce. Since the importance of qualifications changed with the shift in the political focus from academics to skilled workers over the course of the GDR era, it is interesting to study the actual effects on the productivity of its economy.

In the present article, we examine the impact of technical progress on productivity based on original primary data from the Statistical Office in the GDR. We measure technical progress based on staff qualifications and distinguish between *academic workers*, which relate to highly qualified personnel who obtained an academic degree at a university or college¹ in the GDR, and *skilled workers*, indicating qualifications obtained through a master's certificate or as a skilled worker. We expect that the higher the qualifications of the staff, the larger the productivity-enhancing effects on the economy.

Using data on the amount of physical capital (“Grundmittel”), investments, immaterial capital (“Bildungsfonds”), and the number of academic, skilled, and other workers in the GDR, we deliver new results from estimating a Cobb-Douglas production function for the observation period from 1960 to 1989. Our results contribute to studies on the relevance of qualifications for the productivity and growth of a socialist economy and its transformation into a market economy.

¹ Even though universities focused on a broad range of sciences, and colleges (Hochschulen) offered a specialization to particular branches, their terms could be used almost interchangeably in the GDR, because of their little difference in prestige and rank (Giles 1978).

The chapter is structured as follows: Section 2 includes a literature overview and the hypotheses development on technical progress, qualifications, and productivity in the GDR. Section 3 describes our empirical strategy regarding the data and methods used. Section 4 shows our descriptive and regression results, and Sect. 5 discusses the findings and concludes.

2 LITERATURE OVERVIEW AND HYPOTHESES DEVELOPMENT

2.1 The Political System, Technical Progress, and Economic Growth in the GDR

Following the devastating World War II, Germany was divided into four occupation zones, with its production potential severely damaged and weakened. Examples were the dismantling by the victorious powers, withdrawal from current production, brain drain of specialists, and high occupation costs. In the aftermath of World War II, the Allied military governments shattered the economy, which had once been fully developed and operated based on labor division. The Potsdam Agreement provided for the restoration of Germany's political and economic unity. However, the conflicting interests of the victorious Western powers and the Soviet Union soon made this a nonissue. As a result, a "rump economy" was left in the Soviet occupation zone (SBZ) (Karlsch 1993, 55f). The former sources of supply of the raw materials essential for an industrial economy—coal, iron, and steel—were located primarily in the Western occupation zones, and the metal manufacturers in the Soviet zone were cut off from them. As a result, there was a tremendous disparity between the primary and processing industries. After the Berlin blockade of 1948/1949, the Cold War between the victorious powers and the establishment of two states in Germany dimmed the prospects for restoring economic unity within a reasonable time frame. Thus, there were two options to address the disparity between the production economies of the SBZ and, accordingly, the GDR: supplementing the rump economy through integration into the international division of labor or building up a separate production sector covering all key sectors. The decision was politically predetermined due to the monopoly on power in the GDR's ruling party, state

leadership, and its Soviet advisors²: the realization of an industrialization model such as Stalin had prescribed for Russia's backward economy at the end of the 1920s.³

Even though the destruction caused by World War II, the dismantling, and the withdrawal of current production had weakened the production potential, there was no evidence of a technically and economically backward economy that first had to catch up with industrialization according to the Soviet model. Because of the lack of mineral resources, some branches of the primary industry were weakly developed, but there was an efficient machine and vehicle construction industry. Nevertheless, the party and state leadership placed the development of its heavy industry at the center of its planning. This was evident not only by the guidelines of the first Five-Year Plans⁴ but, above all, by the concentration of investment in primary industries and heavy machinery construction. The path to an autarkic economy was paved, and foreign trade was assigned the role of a service provider: Exports of goods had to generate the foreign exchange needed to pay for imports of raw materials. The state had a monopoly on foreign trade. The GDR's admission to the Council for Mutual Economic Assistance (Comecon) established its integration into an economic system based on the division of labor with countries that, except Czechoslovakia,

² On the position of Soviet advisors, see Schneider (2017, 43ff).

³ Stalin's industrialization model included the development of a large-scale and heavy industry, which was necessary for the transformation of the entire national economy based on modern machine technology, for the victory of socialist economic forms, the technical-economic independence of the country from the capitalist environment, and its readiness for defense (Akademie der Wissenschaften der UdSSR/Institut für Ökonomie, 1959, 419). It overcame Russia's economic backwardness from the tsarist era and was realized with the first two Five-Year Plans from 1928 to 1937. Regardless of the special historical circumstances in Russia, this model was later elevated to a universally valid principle of socialist industrialization (Roesler 1981, 1020ff.).

⁴ The first Five-Year Plan, adopted in 1951, p. 7, stated: "Durch den Neu- und Ausbau der Produktionskapazitäten in der Metallurgie, im Schwermaschinenbau und in der chemischen Industrie ist eine weitgehende Unabhängigkeit unserer Volkswirtschaft von dem kapitalistischen Ausland sicherzustellen." The priorities were even clearer in the second Five-Year Plan: "Die vorrangige Entwicklung der Grundstoffindustrie, vor allem der Kohle-, Energie- und Chemieproduktion ist zu sichern," and further, "Der Maschinenbau hat in erster Linie die erforderlichen Ausrüstungen für die Entwicklung der Grundstoffindustrie, insbesondere für Kohle und Energie, zu liefern. Die Produktion von Tagebaugroßgeräten, Ausrüstungen für die Brikettfabriken, Energiemaschinen, Stahlkonstruktionen und anderen wichtigen Schwermaschinenbauerzeugnissen ist dementsprechend zu erhöhen." Gesetzblatt der DDR Teil I, Nr. 5/1958, 42.

were at a lower level of development and primarily needed to catch up in terms of industrialization. The efforts of the highly industrialized countries were thus distracted from their own technical progress.⁵

Thus, in the GDR, considerable labor and capital resources were allocated to the fuel and energy industries, the construction of an iron and steel plant in Eisenhüttenstadt (EKO-Stahl) far from coal deposits and the ore deposit industry, and shipbuilding. In order to avoid bottlenecks in the power supply, coal and energy programs were adopted in 1954 and 1957 to expand the energy supply. This was followed in 1958 by the chemical program. New production capacities for raw lignite, new briquette factories and lignite-based power plants, and the construction of new chemical plants led to the expansion of heavy engineering. Mechanical and electrical engineering were assigned new tasks to manufacture production equipment to mechanize and automate production processes.

The expansion of production possibilities in the heavy industry created a catch-up effect that temporarily spurred economic growth. However, this path hit its limits by the end of the 1950s. The marginal efficiency of capital decreased significantly, and given demographic developments and the migration of thousands of entrepreneurs, engineers, doctors, and scientists to the West, the labor supply diminished. The supply of labor could only be stabilized by the recruitment of new groups of employees, especially women.

For economic growth and increased prosperity, new combinations of production factors and products had to be found with which scarce resources could be used more effectively and productivity increased. In the centrally planned economy, in general, this discovery process did not start in the companies, as the governmental authorities set the priorities and provided the resources. The ruling Socialist Unity Party of Germany (SED) called this “hocheffektive Struktur der Volkswirtschaft” (a highly effective structure of the national economy). To this end, investment was directed primarily into those branches of the national economy considered to be the pacemakers of the scientific and technological revolution. Investments were, in particular, allocated to electrical engineering and electronics, scientific equipment, manufacturing, and branches of mechanical engineering, where “structure-determining” products enabled the

⁵ Only a few new-to-the-world technologies were invented in the GDR. For instance, from 1947 to 1957, the engineer Mauersberger developed the so-called stitch-bonding technique, the products of which were marketed under the Malimo trademark.

planning process. Their share in the investment volume was not a trivial item. In 1970, it amounted to 55% in the chemical industry, 60% in electrical/electronic engineering, and 50% in processing machinery and vehicle construction (Staatliche Zentralverwaltung für Statistik 1971, 54). The application of electronic data processing was emphasized and took place primarily in large-scale enterprises, namely for the preparation, planning, and management of production, for the control of technological processes, for the solution of scientific-technical and economic tasks, and for the calculation and balancing of plans (Gesetzblatt der DDR 1967, 66f). There was, however, no loss of focus on the primary industries. On the contrary, the focus of investment was shifted in favor of innovative products and processes. In the energy industry, coal production was not expanded (Riesner 2009, 2). Instead, the construction of a nuclear power plant for energy production was initiated. The use of liquid and gaseous energy sources was pushed ahead. Priority was given to the expansion of the petrochemical industry. In the iron and steel industry, the expansion of the second processing stage continued with the construction of a cold rolling mill at EKO-Stahl in Eisenhüttenstadt.

To support the strategic plans, the central planning system was reformed in the 1960s. Companies were given greater freedom of disposition, and the profit level, henceforth, measured their economic success. Whereas special factors such as the reconstruction effects had determined production growth in the postwar period, technical progress dominated the increase during the reform period (Ludwig 2017). However, the reform failed due to the incompatibility between other components of central planning and the interests of enterprises. There were disruptions in the relationships between suppliers and final producers as well as supply difficulties for the private households. The reform was abandoned at the end of the 1960s, and a central plan was reinstated to steer the national economy.

In the GDR and other East European countries under the Soviet Union's rule, the accumulation of real capital (expansion of production facilities)⁶ was seen as a decisive basis. However, in the Western market economies, Schumpeter's theory shifted the focus on technical progress and innovation, defined as the development of new or improved products

⁶In the socialist countries, money remained as a means of exchange. However, since it could not be converted into capital, it was therefore understood in the analyses of Eastern economies as physical production facilities (buildings and equipment).

or technologies, as a key driver of growth (Schumpeter 1912, 1942). Shortly after, Solow (1956) had developed a neoclassical growth model that measures technical progress in the form of a production function. Because the quantitative expansion of the factor inputs of labor and real capital could explain only part of the production growth, there remained an inexplicable residual to which the effect of technical progress was attributed. There were initial attempts to relate technical progress to investments in education (Denison 1964). However, neoclassical growth models could not explain how technical progress occurs, in contrast to endogenous growth models, initiated in the early 1990s, mainly by the work of Romer as well as Grossman and Helpman (e.g., Romer 1990; Grossman and Helpman 1994). Of central importance in the endogenous growth model are two variables:

- Education: the skills and abilities of individuals. It is a prerequisite for the emergence of new knowledge and the use of this knowledge in the creation of new products and production processes.
- Knowledge: the stock of knowledge created by productive work. It requires the use of scarce resources—especially education.

For market economies, there is ample evidence on the importance of education for achieving technical progress and productivity (e.g., Erken et al. 2018; Wang et al. 2021). However, evidence on the relevance of education and its relation to productivity in a Soviet-type economy is scarce.

2.2 *Technical Progress and Qualifications in the GDR*

Although the endogenous growth model did not yet exist in the GDR time, the empirical importance of education and qualification for economic growth was already recognized in the 1960s (Ludwig et al. 1972; Maier 1977). From then on, the demand for the intensification of production dominated economic policy.⁷ An essential component was the close linking of production with education and science. It was recognized that the economic strength of the country could be increased with the targeted

⁷ Conceptually, reference was made to the circular scheme of Karl Marx, who had distinguished between “extensively and intensively extended reproduction” in Volume II of *Das Kapital*.

education of highly qualified professionals. The existence of a highly qualified next generation was a necessary condition for economic growth.

Consequently, human capital in the GDR and staff qualifications could be developed, relying on its education system. Following a collectivist vision, the Marxist-Leninist ideology aimed at reducing inequality among people that comes from the natural hierarchy of status groups (Baker et al. 2007).⁸ Therefore, equal chances of education should reduce the social differences in participation in education and increase the technical modernization of the economy (Köhler and Stock 2004; Baker et al. 2007).

Hence, a comprehensive school system up to grade eight (later: tenth) replaced the traditional German three-streamed secondary system of *Gymnasium*, *Realschule*, and *Hauptschule* (Köhler and Stock 2004). After graduation from the *allgemeinbildenden polytechnischen Oberschule* (general secondary school), students could enter the four-year (later: two-year) *erweiterte Oberschule* (upper secondary school), which included more technical and scientific topics. This led to graduation with *Abitur* and higher education. Another option was vocational training (Baker et al. 2007). Concerning higher education, the first university reform targeted the underrepresentation of working-class students to develop a highly trained technical elite and a “socialist intelligentsia” (Axen 1953; Giles 1978). As a result, the enrollment of working-class students increased from 4% in 1946 to 53% in 1958 (Schwertner and Kempke 1967). In addition, the Ministry of Higher and Technical Education introduced *Arbeiter- und Bauernfakultäten* (worker and farmer faculties) as special departments within universities to prepare working-class students for higher education as well as evening and distance courses to educate skilled workers (Baker et al. 2007). In 1951, a second university reform introduced a fixed study period and a set of obligatory courses and requirements for access, such as Russian language, a study of Marxism-Leninism, and membership in the Free German Youth (FDJ) (Giles 1978).

During the 1960s, under the New Economic System of Planning and Governance, academic engineers were regarded as the driving force behind the technical revolution and the leading figure of educational policy, which led to permanent higher education (Köhler and Stock 2004). Ideas about

⁸Apart from reducing material inequality by abolishing private property, the GDR also committed to social and educational equality, which was, however, mostly put back into the economic sphere due to the initial shortage of labor based on denazification and migration to the West after World War II (Wharton 1988).

quotas of working-class students, political records, or courses in the *Arbeiter- and Bauernfakultäten* had been abandoned in favor of academic merit by students from all backgrounds (Baker et al. 2007). Students of low-income families could obtain a monthly basic grant for living; there was no university choice nor a tuition fee, and the study changed from *Grundstudium* (basic study) to *Fachstudium* (subject study) as part of the third university reform (Giles 1978). Because a market for capital or labor was missing, the links between education and jobs needed to be coordinated through state control of job allocation and transfer (Köhler and Stock 2004). By 1961, 81% of all workers were employed in state-regulated enterprises (Baker et al. 2007).

After 1971, as Erich Honecker became the first secretary of the central committee, the SED put the Marxist-Leninist vision of the class struggle between material equality, social security, and the universal socialist-educated person back into focus. The idea was to educate more skilled workers than academics (Köhler and Stock 2004; Baker et al. 2007). Moreover, the SED feared that the highly qualified staff would constitute a breach of the guarantee of employment as academic positions became rare (Köhler and Stock 2004). The threat was seen in the independent, uncontrollable elite with technical expertise and power instead of being committed to socialist values (Giles 1978; Köhler and Stock 2004; Baker et al. 2007). As a result, after a long period of expansion, higher education enrollment rates were reduced in the GDR and also in other socialist states (Reisz and Stock 2006). However, compared to other socialist states, such as Czechoslovakia (10.5%), Romania (9.1%), and Hungary (8.9%), the GDR had already achieved a high percentage of university graduates (39.5%) (Schaefer and Michel 1974, 23). The goal of the period between 1985 and 1989 was to maintain this level and distribution of qualifications (Baker et al. 2007).

Recent empirical studies elaborate on the role of knowledge, education, and technical progress in the GDR. For instance, Günther et al. (2020) show that the importance of education and technical progress based on patents in the GDR should not be underestimated. In this regard, a database with manually cleaned and processed information on 286,478 GDR patents was created (Hipp et al. 2022a). By using newly developed indicators, Hipp et al. (2021) investigate GDR's large investments in the capital stock of R&D-intensive industries, which, however, could not fully unfold their effects on economic growth. This was due to obstacles to innovation (i.e., the central setting of research priorities, limited incentives for

innovation, and restricted knowledge flows). In a related study, Hipp et al. (2022b) show the effect of extensive and intensive sources of growth on industrial productivity in the GDR. The authors found a positive impact of technological progress measured by patents on economic growth and the necessity of investments in the industrial sectors. Finally, by focusing on total factor productivity, Hipp et al. (2023) analyze the productivity-related effects of inventorship in the GDR. They show that the creation, accumulation, and diffusion of knowledge contributed to productivity in the industrial sectors despite several misalignments in the system, distorted incentive structures, as well as limited application in the industry. Only in the presence of sufficient local interactive capabilities, international knowledge diffusion did not result in additional productivity gains.

In the next section, we elaborate on the impact of the levels of education and qualifications of staff on technical processes and productivity in the GDR.

2.3 *Hypotheses on Qualifications and Productivity of the Economic Sectors in the GDR*

2.3.1 *Academic Worker*

The productivity of economic sectors depends on technological development, and technological development can be supported by the educational qualifications of workers (Sachs 1965). The SED aimed at producing more workers with advanced technical skills—that is, engineers, scientists, and high-level technicians—that develop new production processes, increase productivity, and achieve “technocratic modernization” through an expanded education system (Baker et al. 2007; Ludwig 2017). The production of this “socialist intelligentsia” should drive technical expertise and bring political identification to the ideology of socialism (Axen 1953). University education of engineers and business students became important to apply the new scientific knowledge in the economic sectors (Kogut and Zander 1992). Moreover, education and research in the GDR were closely linked to the industry and local community, which was also supported by the structural reforms (Giles 1978). Other political measures were the chartering of colleges that offered degrees in engineering or the *Arbeiter- and Bauernfakultäten* that were introduced in early years to support the access of children from working-class and peasant families to higher education (Baker et al. 2007).

However, measures to increase the educational levels were based on political decisions rather than concrete requirements, which hindered coordinated long-term development (Giles 1978; Köhler and Stock 2004). For instance, the quota system that limited the university access of students from bourgeois families in favor of working-class students underlined the initial class-based ideology (Giles 1978). Additionally, the incentives to obtain a university degree changed: While the industry paid too much over the standard wage for academic graduates in the early years, their wage was cut in the later years when the academics started to threaten the power of the SED (Baker et al. 2007). Moreover, the working load of academics with too many projects, the restrictions of collaboration in research to the Soviet bloc, and the reluctance toward basic research and toward long-term scientific progress in favor of industry-oriented research have been criticized as having negative consequences for economic productivity (Giles 1978). In general, a balance between education and employment cannot be planned, and individual and social interests do not have to be the same (Korn et al. 1984).

Nonetheless, we argue that the increased access to higher education, the academic qualifications, and large technical expertise positively impacted the application of technical skills to improve the production processes and productivity of the economic sectors in the GDR. We therefore hypothesize:

H1. Academic workers had a positive impact on productivity of the economic sectors in the GDR.

2.3.2 *Skilled Worker*

The GDR was also a “workers” and “peasant” state. As the technical level of production and the development of higher education increased since the 1970s, the need for skilled workers with vocational training has been argued to grow in a balanced way (Maier 1977). This would solve the “crisis” of having too many academics without appropriate positions (Dore 1976). While the SED adapted the political measures based on the planning goals, there is no evidence of deficient educational or technical training of the workers (Kogut and Zander 1992). Instead, the qualifications of the technical staff increased, more efficient production methods were introduced (Allen 2001), and a balanced relationship between qualifications and positions was achieved at the end of the 1980s (Baker et al. 2007). In addition, particular incentives to increase productivity in the

industry—other than academic prestige—determined the generation or improvement of new products or processes; this included the strive after social esteem, the reward system, and the low fees of patenting (Lindig 1995). With the regime’s shift to focus on skilled workers, also the wage advantages of this group outweighed the academic positions, which further increased the incentives for vocational training and production work (Baker et al. 2007).

On the other hand, political goals of maintaining the balance between the levels of qualification, through restricted access to higher education or wage advantages for skilled workers, were assessed as more important than free education (Baker et al. 2007). There was almost no public discussion of this restriction but increased dissatisfaction among the workers in lower-qualified positions (Rochlitz and Kasek 1983), which might have impacted their productivity. Moreover, these workers demanded the recognition of their free personality, ideology-free norms and values, and other aspects such as performance differentiation (Kaack 1993). Because the SED could formally reclassify positions, the balance between supply and demand for qualifications contradicted their factual requirements (Köhler and Stock 2004). Moreover, skilled workers were rather occupied with maintaining production and solving short-term shortages than increasing production efficiency (Lindig 1995).

Nonetheless, since it can be argued that skilled workers have a solid technical understanding because they are close to production, and their qualification has been actively supported since the 1970s by the SED, we hypothesize that they contributed to the productivity of the economic sectors in the GDR, too:

H2. Skilled workers had a positive impact on productivity of the economic sectors in the GDR.

3 EMPIRICAL STRATEGY

3.1 Data

To test our hypotheses, we use a set of variables on the national accounts from internal and original primary data of the Statistical Office of the GDR during the observation period from 1960 to 1989. Since published data from socialist states are assumed to be manipulated (Krämer and Leciejewski 2021), but internal statistics had to pass severe controls

throughout political hierarchies, which strongly penalized data falsification, one should only focus on internal and original primary data for an empirical investigation of the socialist period (Steiner 2016).

We created a balanced panel of the respective data for the six economic sectors of the GDR (i.e., industry, construction, agriculture and forestry, traffic, post and telecommunications, domestic trade, and other producing sectors⁹). We use economic data such as the measure of a country's economic performance, the input of physical and immaterial capital, and the labor of different qualification levels. Today, the economic performance of a country is calculated by national statistical offices in the form of gross domestic product (GDP) in the national currency. Until the end of the GDR, such official data did not exist because national accounts were based on the material product system (MPS).¹⁰ The MPS is based on a narrower concept of production than the System of National Accounts (SNA), including GDP, and covers only the production, distribution, circulation, and consumption of tangible goods. Services outside of domestic trade, transport and communication, and industrial research and development are excluded. They are not considered value creators but only mere consumers of tangible goods.

The central measure of a country's economic performance in the MPS is national income (net product). It is not directly comparable with the content and size of the GDP, but it represents the result of the more narrowly defined economic cycle in a consistent system of generation, distribution, and use of tangible goods, and served as the basis for economic policy decisions in the GDR. For these reasons, the following analyses of economic growth use the net product in GDR currency as the central indicator of performance measurement in the GDR. Moreover, data on capital input are also available only in GDR currency. Data on labor input at various qualification levels are collected using the GDR's employment statistics.

⁹ Other producing sectors include economy-related institutes and their centers for research and development, engineering offices, project- and plant-engineering combinates, and product-related services.

¹⁰ In the meantime, the gross domestic product of the GDR has been reconstructed from official primary statistics (Stäglich and Ludwig 2000). However, the data are only available at current prices in GDR currency and are not of an official nature. There have also been individual attempts to deflate and convert them into DM and Euro (Heske 2005, 2009). However, their results do not cover the interdependence of all stages of the economic cycle, and their economic content is questionable because of different types of price settings.

We operationalize the amount of production output Y by the net product, capital C is the amount of capital assets (called “Grundmittel”), and labor L is measured by the number of employees. We then specify labor by using two indicators for the qualifications of the staff as the number of employees with (1) a university degree or a degree from a college, that is, *Academic workers*, and (2) the number of employees with a master’s certificate or a qualification as a skilled worker, that is, *Skilled workers*. As a control variable, we added the number of employees in training or without formal qualification as the variable *Other workers*. Furthermore, we included *Investments* proxied by the amount of investments in the formation of physical capital in the respective economic sector (Ludwig 2017).¹¹ Finally, we introduced *Education funds* (“Bildungsfonds”) as the education expenses materialized in the qualification level of the labor force during the process of preschool education, general education, vocational education, or higher and technical schools (Ludwig et al. 1972). In contrast to current education expenses, it represents a stock figure and a benchmark for the funds of acquired qualification, knowledge, and skills for a longer time period. It was calculated outside of official statistics by the Institute of Economic Sciences at the GDR Academy of Sciences (Wahse and Schaefer 1990) We use the average annual value of education expenses per employee and related it to each sector on basis of the employment structure.

All variables are in constant prices to ensure their comparability over time.

3.2 *Method and Empirical Approach*

Since our interest lies in the relationship between qualifications and sectoral productivity, we estimate a Cobb-Douglas production function, which can be applied to Soviet-type economies (e.g., Kukić 2018; Glitz and Meyersson 2020). The Cobb-Douglas production function is a mathematical representation of production relating the inputs of physical capital, labor, and other factors to their corresponding output. It is an essential tool for understanding productivity and serves as an indicator of economic growth and efficiency by measuring the output per input unit (Buxton

¹¹ Investment data according to economic sectors for the 1960s are only available for the price basis of the year 1980. To enable comparability, we recalculated the investment data for the price basis of the year 1985.

1977). This type of production function measures productivity by estimating the marginal product of each input, helping to identify inefficiencies in production and ways to improve it. Furthermore, it is used to estimate returns to scale (Zellner et al. 1966).

Equation (3.1) depicts the standard Cobb-Douglas production function to estimate productivity. It indicates production output (Y : net product) as a function of a scale factor (A), labor (L), and capital (K). Further, β_1 and β_2 are the share of contributions for L and K . A growth in β_1 and/or β_2 will lead to a growth in output (Buxton 1977). By transforming the variables into logs, we yield Eq. (3.2). Equation (3.3) then specifies the labor input using the subgroups of academic, skilled, and other workers, and it adds the respective inputs of education funds, capital, and investments to the productivity analysis.

The Cobb-Douglas production function is:

$$Y = A \times L^{\beta_1} \times K^{\beta_2} \quad (3.1)$$

Transformed into logs, the equation follows the specification:

$$\ln \text{Net product}_{it} = \delta_0 + \beta_1 \ln \text{Labor}_{it} + \beta_2 \ln \text{Capital}_{it} + \varepsilon_{it} \quad (3.2)$$

By specifying labor input and adding the control variables, we estimate the equation:

$$\begin{aligned} \ln \text{Net product}_{it} = & \beta_0 + \beta_1 \ln \text{Academic Workers}_{it} \\ & + \beta_2 \ln \text{Skilled Workers}_{it} + \beta_3 \ln \text{Other Workers}_{it} \\ & + \beta_4 \ln \text{Education funds}_{it} + \beta_5 \ln \text{Capital}_{it} \\ & + \beta_6 \ln \text{Investments}_{it} + \varepsilon_{it} \end{aligned} \quad (3.3)$$

We tested Eq. (3.3) using the feasible generalized least squares (FGLS) approach, with time and sector fixed effects. FGLS is a statistical technique that is used to estimate the parameters of a linear regression model when the errors are heteroscedastic (unequal variance) or autocorrelated (dependent on previous values) (Härdle and Simar 2012; Mertler et al. 2021). FGLS has many advantages compared to other estimation techniques, as it provides consistent and efficient estimates of the regression parameters (Härdle and Simar 2012). This is important because it allows us to more accurately estimate the effects of the independent variables on the

dependent variable and helps avoid bias in the results. However, we also applied a standard ordinary least square (OLS) approach as a robustness test, and the results remain stable. Equally important, we accounted for a potential lack of independence within groups using a mixed methods approach, and the results hold.

4 RESULTS

4.1 Descriptive Statistics and Graphical Trends

Table 3.3 shows the descriptive statistics, and Table 3.4 provides the correlations of our variables.

Figure 3.1 depicts the development of the net product and its input factors for the economic sectors in the GDR during our observation period. The industrial sector was the GDR's most significant contributor to the net product, accounting for around 43% of the total net product in

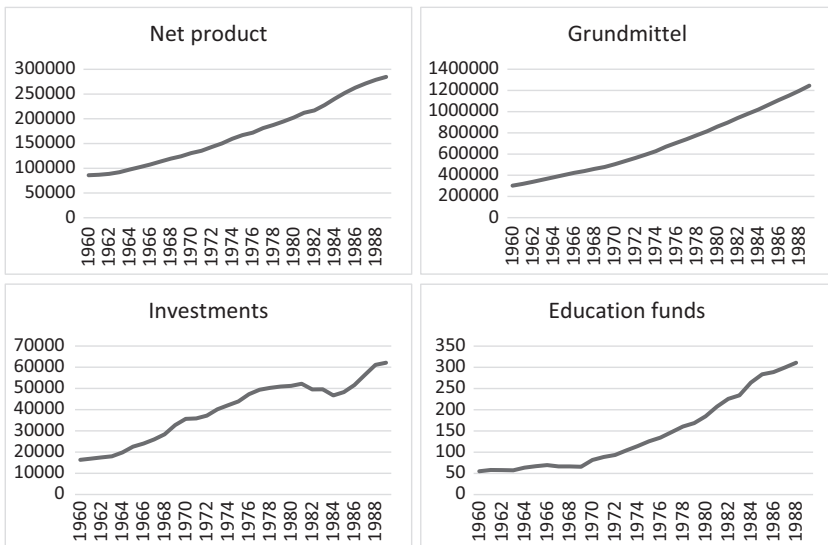


Fig. 3.1 Development of the net product and its input factors (in Mio. GDR currency) of the economic sectors in the GDR over time

1989. Moreover, this sector was a significant driver of economic growth, with consistent growth over the years. The second largest driver was agriculture and forestry, followed by domestic trade, construction, transport/post/telecommunications, and other producing sectors. Except for agriculture and forestry, which experienced a decline at the beginning and at the end of the 1960s, during the mid-1970s, and at the end of the 1980s, all other economic sectors grew continuously.

Regarding the input factors, capital, measured by “Grundmittel,” and education funds show a continued increase over time within all economic sectors in the GDR. Investments increased until 1981, then slightly decreased, and only increased again from 1985 onward. While this development is mainly observed for agriculture and forestry as well as construction and domestic trade, a growth of investment over time took place in the industry, transport/post/telecommunications, and other producing sectors.

Figure 3.2 depicts the development of the number of employees of the economic sectors in the GDR over time. The total number of employees decreased until the end of the 1960s, then increased, and decreased again

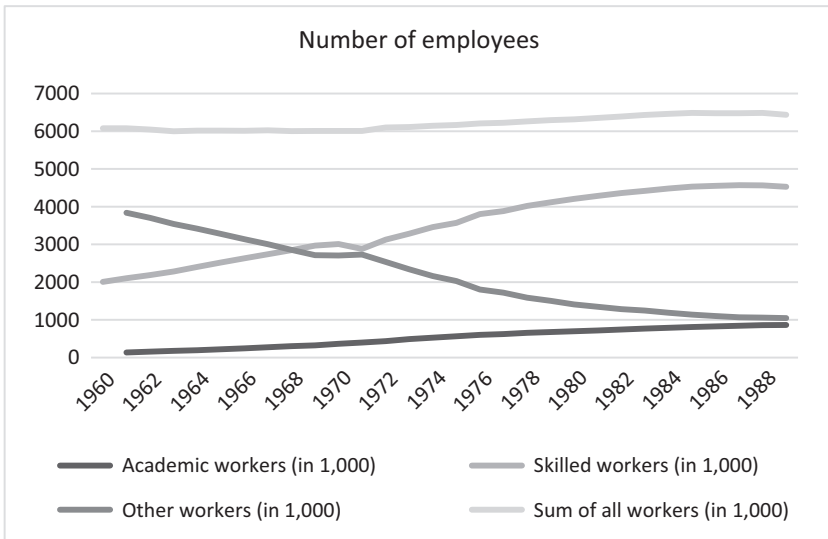


Fig. 3.2 Development of the number of employees of the economic sectors in the GDR over time

from 1986 onward. While the number of academic and skilled workers increased over time, the number of other workers decreased. The number of skilled workers shifted in the 1970s to be the largest contributor to the GDR's economic sectors, especially to the industry sector. Only in *other producing sectors*, the number of academic workers is higher than the number of skilled workers over time.

4.2 Regression Results

Table 3.1 contains the regression results of our model estimations. Models 1–3 include the control variables and one of our variables of interest, that is, the number of academic workers, skilled workers, or other workers. While the number of academic workers and other workers positively and significantly impacts the net product at a 1 to 10 significance level, the

Table 3.1 Relationship between academic and skilled workers and net product

	(1)	(2)	(3)	(4)	(5)
VARIABLES	ln_Net product	ln_Net product	ln_Net product	ln_Net product	ln_Net product
ln_Academic workers	0.069* (0.035)			0.090*** (0.028)	0.035 (0.034)
ln_Skilled workers		0.009 (0.007)		0.065*** (0.008)	0.036*** (0.010)
ln_Other workers			0.098*** (0.023)	0.177*** (0.027)	0.145*** (0.030)
ln_Education funds	0.106*** (0.036)	0.069* (0.038)	0.081** (0.036)		0.058 (0.037)
ln_Capital	0.195*** (0.040)	0.222*** (0.035)	0.183*** (0.038)		0.124*** (0.038)
ln_Investments	0.049** (0.023)	0.042* (0.023)	0.093*** (0.024)		0.066*** (0.023)
Constant	5.100*** (0.499)	5.411*** (0.542)	5.330*** (0.536)	8.451*** (0.045)	6.186*** (0.589)
Chi ²	25277.35***	25746.61***	29696.22***	28278.94***	30811.29***
Observations	180	180	180	180	180
Sector and year fixed effects	Yes	Yes	Yes	Yes	Yes

Standard errors in parentheses

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

number of skilled workers exerts no influence. The control variables of education funds, capital, and investments positively and significantly impact the net product. Model 4 then introduces all types of workers but without the control variables. Here, the coefficients of academic and other workers remain positive and significant, and the coefficient of skilled workers turns significant. Model 5 finally adds all variables to our baseline model. While the coefficients of skilled and other workers and the control variables of capital and investments remain positive and significant, the coefficients of academic workers and education funds turn insignificant.

Now we turn to our primary focus, which is the role of academic and skilled workers for productivity gains in the economic sectors of the GDR. Academic workers are observed to contribute to the net product in all models except for the last one. The growth in the number of academic workers increases the net product up to 9%. This positively significant effect of academic workers in most model specifications supports our first hypothesis. Regarding skilled workers, the coefficients are positive and significant in all models except for the first model. They contribute up to 6.5% to the net product, which supports our second hypothesis. However, the coefficients of skilled workers are much smaller than the coefficients of academic workers, and they become only significant when academic workers are included in the models. This underlines their smaller contribution to and dependence on academics for productivity gains in the GDR. However, all this subordinated the influence of the capital stock. The transfer of knowledge and innovation, materialized in investments, also seems to support productivity growth.

As a robustness check, we lag the variables by one to three years to test if certain inputs such as qualifications or education funds need time to translate into new or improved products or processes and, then, result in productivity gains. Table 3.2 provides the results of the robustness check for the lag of one year. The coefficient of academic workers remains positive and significant and even increases in size in all models. Growth in the number of academic workers increases the net product even up to 9.1%. However, the coefficient of skilled and other workers turns insignificant in all models, negating a longer-lasting effect on productivity. The effect of the control variable of education funds turns significant and increases in size in all models, contributing to the net product up to 27.6%, which underlines its longer-term influence on productivity gains. The control variables of capital and investments turn insignificant in all models. When testing for the longer time lags of two to three years, the results remain

Table 3.2 Relationship between academic and skilled workers and net product (lagged by one year)

	(1)	(2)	(3)	(4)
VARIABLES	ln_Net product	ln_Net product	ln_Net product	ln_Net product
ln_Academic workers_1	0.080** (0.032)			0.091** (0.038)
ln_Skilled workers_1		-0.006 (0.012)		-0.002 (0.013)
ln_Other workers_1			0.026 (0.024)	-0.016 (0.034)
ln_Education funds_1	0.250*** (0.052)	0.248*** (0.062)	0.249*** (0.059)	0.276*** (0.078)
ln_Capital_1	-0.040 (0.033)	-0.004 (0.028)	-0.028 (0.031)	-0.036 (0.034)
ln_Investments_1	-0.018 (0.029)	-0.016 (0.027)	-0.012 (0.027)	-0.024 (0.030)
Constant	8.969*** (0.236)	8.984*** (0.230)	9.056*** (0.224)	9.023*** (0.256)
Chi ²	23681.42***	28612.17***	29091.97***	23321.06***
Observations	179	179	179	179
Sector and year fixed effects	Yes	Yes	Yes	Yes

Standard errors in parentheses

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

qualitatively the same. When adding the craftsmen to the industry sector, we observe a longer-lasting positive and significant effect of skilled workers; however, the respective coefficient remains much smaller than the coefficient of academic workers. Omitting the control variables in the first models also leads to similar results.¹²

5 DISCUSSION AND CONCLUSION

This chapter investigates the impact of technical progress—based on the contribution of academic and skilled workers—on economic growth and productivity of the economic sectors in the GDR. First, we provide a literature overview on the development of academic and skilled workers in

¹² Results are available upon request.

the GDR and hypothesize their relation to economic productivity. Then, the hypotheses are tested by using original primary data on the national accounts and employment statistics from the Statistical Office of the GDR on the level of six economic sectors from 1960 to 1989.

In the first decade of its existence, economic growth in the GDR was primarily determined by the expansion of capital stock as a factor of production. The increasing equipment of workplaces with machines and plants made labor, the supply of which increased only slightly, more productive. The increase in labor productivity became the decisive source of economic growth. In addition, capital input per unit of production fell, and so the increasing efficiency of capital supported economic growth. From the 1960s onward, it was hardly possible to draw on these two sources of growth. Labor productivity continued to rise as a result of strong investment in the capital stock, but the efficiency of the capital stock declined. Job expansion and renewal lagged behind in technical terms, and more and more capital was needed to sustain economic growth. Interruptions in this trend occurred only during the years of economic reform and briefly in the mid-1980s.

This analysis assumes homogeneity of factor inputs and does not explicitly investigate how technical progress works. This is remedied by the production function that relates to the quality of factor growth and includes intangible factors, such as knowledge. Our regression results for the years from 1960 onward support the dominant influence of capital input and investments on the quantitative expansion of the use of production factors in the GDR. These effects are, however, only short term, which hints at a low level of innovative strength and the ineffectiveness to use these inputs as catalysts of economic growth in the longer term. The quantity of the factor labor plays a subordinate role since its supply increased only slightly as a result of demographic developments and labor market policy measures. With the differentiation of labor input by qualification levels, we show the importance of two groups, academic and skilled workers, on the growth of net product.

Our first hypothesis postulates a positive relationship between the number of academic workers and the productivity of the economic sectors in the GDR. Our regression results support this relation, which remains largely consistent across the specifications, especially when introducing longer time lags. This shows that academic workers have a (longer-term) productivity-enhancing effect across the entire observation period despite the political shift in the focus from academic to skilled workers during the

1970s. We contribute to the larger debate on how knowledge, capabilities, and qualifications were able to develop in a socialist system and on their effect for technical progress and productivity of the economy (Kogut and Zander 1992; Allen 2001; Berliner 2019). Furthermore, our findings go beyond these studies by focusing on a high level of education and academic qualifications that improved the development and transfer of new technologies applied to production processes, thereby increasing the growth and productivity of the economic sectors in the GDR over longer time periods. Remarkably, this holds even despite the growing disparities between the demand for qualified labor in workplaces and the factual occupation slowdown in the proportionate employment of highly qualified people. Moreover, the efficiency was weakened by institutional obstacles in the system, the Cold War-induced isolation from the world markets, and the West's embargo lists for high technologies. The consequences of these issues consumed immense resources of the GDR, which made it unable to catch up with the international level of development until its end (Marschall 1990).

The second hypothesis posits a positive impact of skilled workers on productivity of the economic sectors in the GDR. Our findings mostly support a productivity-enhancing effect of skilled workers; however, it is much smaller and only short term compared to the effect of academic workers, which underlines the importance of academic workers for boosting economic growth. This finding contributes to the results of research concerning the shift in the focus of the SED from academic qualifications to skilled workers in the GDR (Dore 1976; Maier 1977; Baker et al. 2007). In contrast to the aim of the SED in the 1970s, when the number of academic workers was reduced in favor of more skilled workers, this approach did not, for the most part, improve production efficiency of the economic sectors. This might be explained by the restricted focus of skilled workers on basic research and long-term scientific progress (Giles 1978) or their limited productivity-enhancing tasks (Lindig 1995).

Our analysis provides further interesting findings about the impact of education funds on productivity gains in the GDR. The SED directed all economic activities and allocated respective resources to the various sectors of the economy. High investments were made during the early years in the training and education of workers (Baker et al. 2007). These investments resulted in a long-term efficiency increase by supporting the development of a highly skilled and productive workforce. Moreover, at the beginning of the GDR, many employees were in training or without

formal qualification. The respective political measures led to a continued and substantial reduction of this number in favor of skilled and highly qualified workers over time. At the end of the GDR, there was a smaller number of employees without qualification, but a noticeable number of academic and skilled workers that contributed to the transition of the system and the subsequent productivity of the economy. Only the shift in the political focus from academics to skilled workers during the last two decades of the GDR might have caused a long-lasting impact on the structural change of East Germany today (Dietrich 1991).

Future research could analyze the long-term effects of the education funds and qualifications in the GDR for economic growth after its transformation into a market economy. With the end of the GDR, research on education funds was discontinued. This also removed a field of research that could have shed light on the economy's transition to market-based principles in the area of education and skills. As a result, methodological problems also remained unresolved, such as the consideration of changing skills and abilities required from the labor force in the analysis of education funds. So far, the dynamics of the funds resulted from the balance of entries and exits of persons and the changing costs of education and training. However, as production processes evolve, demands on knowledge and skills of the active population changed over the course of a working lifetime. Furthermore, it would be interesting to understand how qualifications facilitated patenting activities in the GDR. Because patents are mostly generated in the industry sector, an in-depth analysis of the related qualifications of the staff will be promising. For this purpose, more data should be collected and prepared from the socialist period to generate new knowledge on the respective relations.

In summary, education had a high priority in the socialist system of the GDR to achieve technical progress and growth of the economy. The SED sought to enhance its productivity and technical modernization with its initial goal of equal educational opportunities for all people in the society, supporting the children of workers, and increasing the number of academics (Köhler and Stock 2004; Baker et al. 2007). However, the retraction of these goals in later decades in favor of ideological and political protection of the regime was not only assessed critically in society (Kaack 1993). It was also a setback for the productivity and growth of the economy. Despite the high level of education and capabilities of the workers, the internal and external obstacles to modernization seemed to be ubiquitous in the system of the GDR, explaining the economic backlog and the final collapse of the regime.

APPENDIX

Table 3.3 Descriptive statistics

<i>Variables</i>	<i>Obs</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Min</i>	<i>Max</i>
ln_Net product	180	9.694	0.979	7.817	12.125
ln_Academic workers	180	3.873	1.178	0	6.178
ln_Skilled workers	180	5.613	1.896	0	7.717
ln_Other workers	180	5.285	1.342	0	7.379
ln_Education funds	180	15.895	3.136	0	18.897
ln_Capital	180	10.82	1.33	8.339	13.592
ln_Investments	180	7.944	1.317	4.954	10.703

Table 3.4 Correlations of variables

<i>Variables</i>	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) ln_Net product	1.000						
(2) ln_Academic workers	0.687***	1.000					
(3) ln_Skilled workers	0.747***	0.346***	1.000				
(4) ln_Other workers	0.469***	0.533***	0.341***	1.000			
(5) ln_Education funds	0.209***	0.101	0.209***	0.187**	1.000		
(6) ln_Capital	0.842***	0.635***	0.655***	0.388***	0.178**	1.000	
(7) ln_Investments	0.886***	0.625***	0.732***	0.454***	0.210***	0.957***	1.000

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

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Historical Legacies of Regional Innovation Activity: The Case of East and West Germany

Michael Fritsch, Maria Greve, and Michael Wyrwich

I TRACING THE LEGACIES OF GERMAN DIVISION AND REUNIFICATION

The 40 years of German separation into a capitalist West and a communist East after the Second World War (WWII) and the sudden reunification have left deep traces in many respects. Our contribution deals with these effects on innovation activity. To this end, we compare the innovation

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activity in East and West Germany before WWII, at the end of the socialist East German regime, and particularly in the period after German reunification in the year 1990. This comparison includes the level, the technological profiles, and the development of the regional structure of innovation activity. Our analysis demonstrates strong effects of the German separation and reunification on the regional innovation landscape within East Germany as well as rather pronounced repercussions for innovation activities in the West.

The empirical analysis in this paper is largely based on patents for several reasons. A main advantage is that patent data are available over relatively long periods of time. Patents also represent inventions of a certain minimum quality, which makes them comparable across countries, regions, and time periods. Patent data also provide important information such as the names and addresses of the applicants and the inventors, the knowledge fields (International Patent Classification, IPC class) of inventions, and information regarding specific knowledge input (citations) and the impacts of patented inventions on subsequent patents (for an overview, see Griliches 1990; Nagaoka et al. 2010).¹

The remainder of this chapter is organized as follows. We begin with a brief overview of the history of innovation activity in Germany since the late nineteenth century (Sect. 2) and then analyze the development of the level of patenting in East and West Germany in this period (Sect. 3). Section 4 presents similarities in the technological profiles of patenting activity in both parts of the country and chronicles their developments. Section 5 describes shifts in the regional structures, and Sect. 6 concludes.

2 A SHORT HISTORY OF INNOVATION ACTIVITY IN GERMANY

At the end of the nineteenth century, Germany became one of the world's leading industrial powers, advancing in technological fields that were characteristic of the second industrial revolution, such as chemicals, pharmaceuticals, automobiles, and electricity (Grupp et al. 2002). The country

¹A disadvantage of patents is that they represent only the first stage of the innovation process. Therefore, one does not know if, when, or how an invention is applied in a new process or product (Feldman and Kogler 2010). Another critical issue is that not all inventors and firms use patents to protect their intellectual property (Cohen et al. 2000; Blind et al. 2006). Hence, not all inventions are patented. Moreover, some inventors obtain multiple related patents for basically the same invention to block follow-up patents from rivals.

lost its leading position during the Nazi era with the expulsion of Jewish scientists (e.g., Waldinger 2012) and the devastation of WWII, which led to its separation into a communist East German state that was integrated into the Communist Bloc (the German Democratic Republic, GDR) and a Western-style capitalist market economy in the West (the Federal Republic of Germany, FRG), both founded in the year 1949.

In contrast to West Germany, East Germany, which came under Soviet occupation after WWII, faced substantial dismantling of industrial and innovative structures that were largely relocated to the Soviet Union (Ritschl and Vonyó 2014; Steiner 2010). The innovative potential of the GDR also massively declined because many innovative firms relocated from the East to the West in order to escape the communist regime. Likewise, East Germany experienced a considerable exodus of population, particularly of well-qualified and entrepreneurial-minded people, up until the closure of its western border in August 1961 (Ritschl 2010; Falck et al. 2013; Ritschl and Vonyó 2014; Becker et al. 2020).

The Soviet-style innovation system established in the GDR proved relatively inefficient (Mayntz 1998; Radosevic 1998; Kotz et al. 2002; Augustine 2007). A main deficiency of this system was that research and development (R&D) activities were organized according to a linear model of innovation that is particularly inattentive to feedback loops (for a schematic overview of actors and linkages, see Meske 1993). As a result of this rigid organization, the GDR innovation system failed to adapt its industrial and innovative capacities to global developments such as the oil crises of the 1970s (Blum and Dudley 2000). Another obstacle to innovation activities faced by the GDR was the closed border to the technologically more-advanced West, which hindered connections to global knowledge flows (Grupp et al. 2002). Moreover, the Western countries introduced an embargo on the Eastern Bloc for the export of innovative goods, which hampered these countries' access to modern Western technology.

The communist East German regime collapsed quickly and unexpectedly after the fall of the Berlin Wall in November 1989. In July 1990, the two German states introduced a currency union, followed by formal reunification in early October, whereby the formal institutional framework of West Germany was transferred to East Germany practically overnight (Brezinski and Fritsch 1995; Hall and Ludwig 1995). This sudden shock transition in East Germany involved a massive decline in the industrial sector. Many formerly state-owned enterprises could not compete effectively and were shut down (Burda and Hunt 2001). Only a few viable firms

survived (Mergele et al. 2020), sometimes as extended workbenches of West German and international companies, without any significant individual innovation activities. Most large state-owned enterprises were split off and transformed into unrelated small and medium-sized firms (e.g., Radosevic 2022).

Since the beginning of the transformation process in 1990, there has been a persistent East–West gap in innovation activities. Despite massive subsidies for private sector R&D activity and considerable investment in universities and public research institutes, the average level of innovation activity in East Germany is consistently lower and less productive than in West Germany (Fritsch and Slavtchev 2011; Rammer et al. 2020).

3 PATENTING ACTIVITY BEFORE, DURING, AND AFTER GERMAN SEPARATION, 1877–2015

Our basic approach to identifying the effect of 40 years of the East German socialist regime is to compare patenting activity before WWII and after reunification. In our assessment, we assign every patent to a labor market region that is defined by NUTS3 codes (BBSR 2019), each representing a functionally integrated spatial unit based on commuting patterns. We exclude Berlin from our analysis because, both in the period before separation and after, various factors render it impossible to distinguish between East and West.²

Figure 4.1 presents patenting intensity in East and West Germany as the number of patents per 10,000 population before the separation in the period 1877–1945, in the years 1980–90, and post-unification from 1991 to 2014. Peculiarities of the East German patenting system under socialism hamper a direct comparison of patent data with the FRG. The main issue is that inventors in the socialist regime did not have to pay a registration fee, as was the case in West Germany, but rather received a financial reward for filing a patent. As a result, the number of patents filed by East

²Berlin was divided into four occupation zones, and only the Soviet-occupied part, East Berlin, belonged to the GDR. The other three occupation zones in Berlin (i.e., West Berlin) were given a special status and were closely linked to the FRG, both economically and politically. There are no reliable separate statistics for the economic situation in East and West Berlin since German unification in 1990, nor would such statistics be meaningful given the extensive integration of both parts. Berlin is therefore excluded in the empirical analyses. We also omit the Saarland region because it was not in the data from 1920–35, when the League of Nations managed the area.

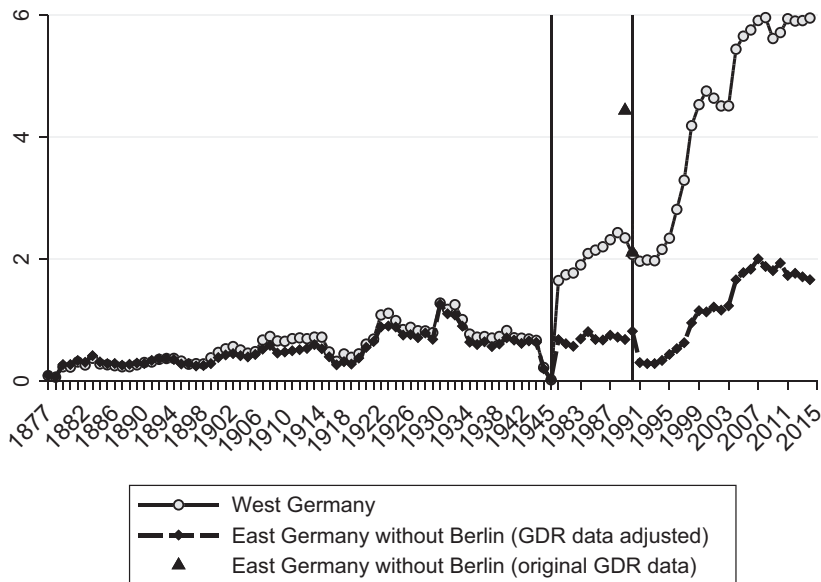


Fig. 4.1 Average number of patent applications per 10,000 population. Notes: The data for the pre-WWII period (1877–1945) and 1980–2014 for West Germany, as well as 1991–2014 for East Germany, are from PatentCity (Bergeaud and Verluise 2022). Vertical lines indicate the period of separation (1945–90). Data for East Germany between 1980 and 1990 is an adjusted measure based on Rassenfosse et al. (2019). Direct comparison between East and West Germany during the separation is not possible due to distinct systems of rewards and incentives. The non-adjusted number of East German patents in the year 1989 is taken from Hipp et al. (2023)

German inventors per 10,000 population was considerably larger than the number of patents filed by their West German counterparts.³ In order to make the patents in East and West during the GDR period comparable, we calculate an adjusted number of GDR patents. Based on the assumption of a similar ratio between international and national-only patents in both

³While the share of national-only patents was rather high, the share of international GDR patents was much lower than in the West. Since we have no information about the residence of the inventors for GDR patents before 1989, we cannot omit international patents and patents of inventors with residence in East Berlin like in the other years.

parts of the country, we estimate the adjusted number of East German patents using the number of international patents.⁴

Figure 4.1 suggests that patenting intensity during the pre-separation years was very similar in the two parts of the country. Based on the adjusted number of East German patents, patenting activity in West Germany during the 1980s was much higher. However, the unadjusted number of patents per 10,000 population was considerably higher in the GDR.

In 1991, the first year for which directly comparable data exist, we find only 0.31 patents per 10,000 population in East Germany, which is only 14.5% of the respective value for West Germany (2.14 patents per 10,000 population). Given that there was no significant East–West difference in patenting activity before the German separation, this difference indicates a rather pronounced negative impact of socialism on inventive activity.⁵

German reunification led to a radical reorganization of the East German innovation system. There was a sharp decline in East German patenting activity in the first years after reunification compared to the level in 1989/90. It is interesting that there was a negative trend in innovation activity in West Germany in 1989 and 1990, just before German reunification. Starting in the mid-1990s, however, patenting activity increased in both parts of the country, but because the increase of patenting intensity was considerably stronger in the West, the ongoing integration of the two innovation systems did not lead to convergence, especially in the second part of the 1990s. Starting in 2008, East German patenting intensity slightly declined, while increases continued in the West.

Overall, the strong increase in patenting activity in West Germany suggests that the West was able to benefit significantly more from the integration of the two innovation systems than the East. At the end of our observation period in 2014, the East–West gap of patenting intensity amounted to about 4.3 patents per 10,000 population. This is four times larger than the difference that was found at the end of the socialist period in 1991. This process of divergence is rather remarkable given the high level of public support such as financial subsidies for innovation activity in the East.

⁴Had the share of international patents in the GDR mimicked that seen in the FRG, the average number of patent applications per 10,000 population in the GDR would have been 0.60 in 1989, much lower than the respective value of 2.75 for the FRG. Simultaneously, the original (non-adjusted) number of patents registered at the GDR patent office was about 4 patents per 10,000 population (see Fig. 4.1).

⁵A multivariate difference-in-difference analysis that accounts for a number of regional determinants of innovation behavior confirms the magnitude of this effect; see Fritsch et al. (2023a).

4 TECHNOLOGICAL SHIFTS OF INVENTIVE ACTIVITY IN GERMANY OVER TIME

Comparing the technological composition of inventive activity in East and West Germany at the end of the socialist period in the year 1989,⁶ we find a rather high level of similarity.⁷ The correlation coefficient for the shares of patents in all IPC classes in the East and West in the year 1989 was about 0.6. Figure 4.2 illustrates this correspondence by showing the share of patents in the top 15 technological fields in East Germany and the respective share for West Germany.⁸

There are at least two reasons for this high level of similarity after more than 40 years of separation. First, in the pre-separation period, East and West Germany constituted an integrated innovation system with a common technological profile. Second, GDR political leadership pushed scientists and engineers to catch up with technological developments in Western countries, particularly in West Germany (Steiner 2010), resulting in research activities in corresponding technological fields.

The rather high similarity of technological profiles between East and West at the end of the socialist period can be attributed to a process of consolidation (*Flurbereinigung*), which was carried out largely at the expense of innovation activities in the East. In this consolidation process, West German research projects that were generally more advanced frequently outcompeted their East German counterparts (Grupp et al. 2002). This led to a growing East–West difference in patenting, particularly in

⁶Unfortunately, the available patent data for the time before WWII do not include information on the technological classification of an invention. For the technological profile of West Germany in 1989, we use RegPat data because the geocoded data by Rassenfosse et al. (2019) do not include information on the technology class of patents. For East Germany, we use data provided by Hipp et al. (2023) that encompasses the entire universe of granted patents in the GDR. We exclude foreign patents that were registered in the GDR because our focus is on the technological profile of East German inventors. For calculation of the technological profile in 2014, we use RegPat for both East and West Germany.

⁷The unit of analysis is IPC class ($N = 743$). Each IPC class is allocated to a specific technological field ($N = 35$) following Schmoch (2008).

⁸For both years, the technological fields are sorted according to the ranking for East Germany. There is hardly any technological field that is not in the top 15 in both East and West Germany.

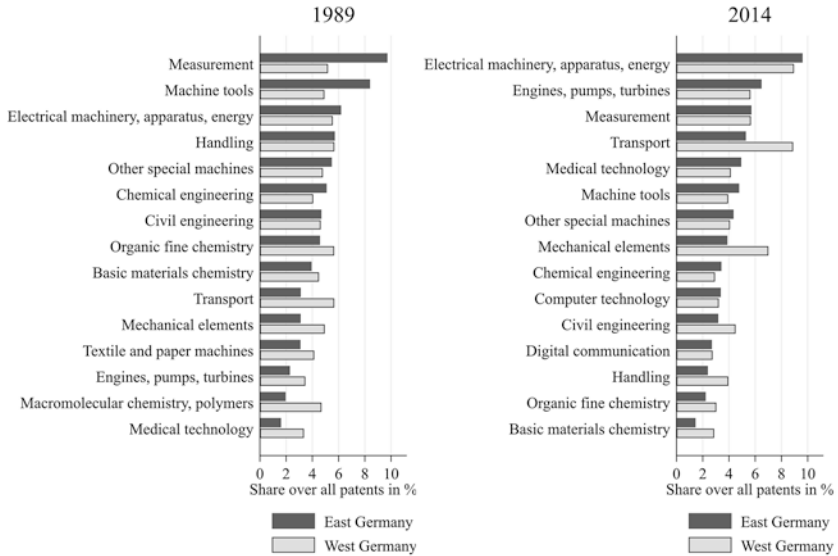


Fig. 4.2 Top 15 technological fields by the share over all patents (in %) in East and West Germany, 1989 and 2014

those technological fields where East and West Germany were both specialized in 1989, and hence implied a slight reduction of technological similarity. Since detailed analysis reveals that this consolidation process was largely completed in the first few years after the transition (Fritsch et al. 2023a), it can hardly contribute to explaining the increasing East–West gap in patenting that we see in the long term (Sect. 3).

From the mid-1990s onward, we see an increasing similarity of technological profiles of inventive activity in East and West Germany, such that the correlation coefficient for the shares of patents in all IPC classes increased even further, exceeding 0.7 in 2014. This increasing similarity of technological profiles was mainly due to the increase in patenting by East German inventors in technological fields that were quite common in West Germany but largely absent in the socialist system (for a more detailed analysis, see Fritsch et al. 2023a). The lack of East German experience in these technological fields may explain lower levels of patenting and the difficulties East Germany faced in catching up to West Germany. At the

same time, there were relatively few technologies where only East Germany specialized, making it hard to compensate for falling behind in technologies where West Germany had historically gained efficiency advantages.

5 REGIONAL SHIFTS IN INVENTIVE ACTIVITY IN GERMANY AFTER WWII AND GERMAN REUNIFICATION

German separation into a capitalist state and a socialist state after WWII, as well as the transformation process that began with reunification, led to extensive changes in the country's geographic innovation landscape. Figure 4.3 shows the number of patents per 10,000 population across German regions in the year 1938, just months before the outbreak of WWII. At that time, patenting activity in East and West Germany was generally at fairly similar levels, with highly innovative regions widely spread over the country. Eastern regions with relatively low levels of inventive activity were concentrated in the north of Berlin, while many low-patenting regions in the West were in its southeast (Bavaria). Regions with particularly high levels of patenting were Berlin, the southern part of East Germany, the region of Cologne, and larger areas in the southwest (Baden-Württemberg). At that time, the East German region of South Saxony around Dresden and Chemnitz was one of the most industrially advanced regions in Germany and even across Europe (Gutberlet 2014).

After WWII, the former German territories east of the rivers Neisse and Oder became part of Poland and the Soviet Union, and 14 million people were expelled and had to be integrated into the two newly emerging German states, the FRG and the GDR. At the same time, about 25% of the East German population emigrated from the GDR to the FRG until the closing of the border in 1961. These massive territorial changes and population movements implied a reorganization of regional economic structures. For example, about 9–13% of all East German firms—especially from the south of East Germany (particularly Saxony and Thuringia)—relocated to West Germany, particularly to Baden-Württemberg and Bavaria (e.g., Hefele 1998; Falck et al. 2013). This exodus included a number of well-known large firms, such as car manufacturers Audi and BMW as well as the Siemens company, and contributed to reshaping the local industrial structures in both parts of the country.⁹

Another factor was that the GDR government implemented several large-scale spatial policy projects that had a strong impact on the industrial

⁹For examples from the machine-tool manufacturing industry, see Falck et al. (2013).

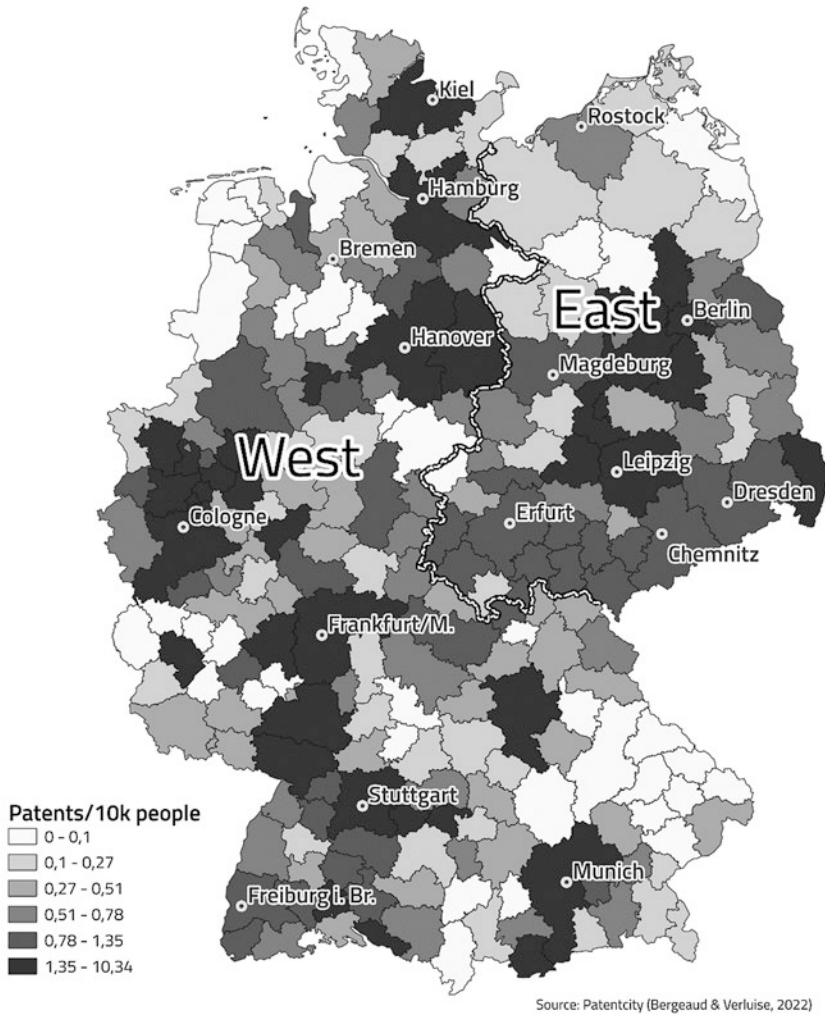


Fig. 4.3 Patents per 10,000 population, 1938. Notes: Solid borders outline the former GDR territories. Patents are assigned to regions according to the location of the applicant. Source: PatentCity (Bergeaud and Verluise 2022)

landscape of the East. One important building block of this policy in the GDR was to promote the industrialization of regions in the north that were heavily reliant on agriculture. Two famous examples are the creation

of a large steel complex in Eisenhüttenstadt and a petrochemical complex in Schwedt, two peripheral cities in the north lacking any industrial tradition. Berentsen (1981) vividly describes these cases and argues that the GDR intended to industrialize the northern regions in order to reduce regional disparities.

An exemplary case for this policy is the region of Mecklenburg, where in 1925 almost half of the population worked in agriculture, compared to only about 10% in South Saxony (Fritsch et al. 2023b). The share of the workforce employed in agriculture in Mecklenburg decreased to about 20% between the mid-1950s and 1990. At the same time, the share of manufacturing employment rose from 13% to about 23%. A good share of manufacturing employment was in the shipbuilding industry, which was developed from scratch because the previous centers of German shipbuilding on the coast of the Baltic Sea became part of Poland after WWII (for details, see Mohs et al. 1984; Mieck 2009).

Other prominent examples of massive investments into new production plants include chemical manufacturing, lignite coal mining, and energy production in the Halle-Leipzig-Dessau triangle, and industrial agglomerations in South Saxony that built on the industrial heritage of the time before WWII.

Figures 4.4a and b display the regional structure of patenting intensity in the year 1989, just before the East German socialist regime collapsed. We show separate maps for East and West Germany because comparisons of patent numbers between the two parts are confounded by the much stronger incentives for filing a patent in the GDR system, which resulted in significantly higher numbers of patent applications there (see Sect. 3). Compared to the regional structure of the year 1938 (Fig. 4.3), some regions in the north of East Germany, particularly those on the coast of the Baltic Sea, had significantly increased their level of inventive activity, while the high level of patenting in the regions south of Berlin remained steady (Fig. 4.4a). In West Germany, there was a shift of patenting activity from the Ruhr area and further north to the south, particularly to the region of Munich, which was not a center of innovative activity before WWII (Fig. 4.4b).

In 2014, about two and a half decades after the collapse of the GDR regime, we see a clear East–West gap in patenting (Fig. 4.5). Innovation activity in East Germany is concentrated in a few highly innovative “pockets of excellence,” namely Berlin, Dresden, and Jena. All other East German regions perform relatively poorly. Quite remarkably, all three

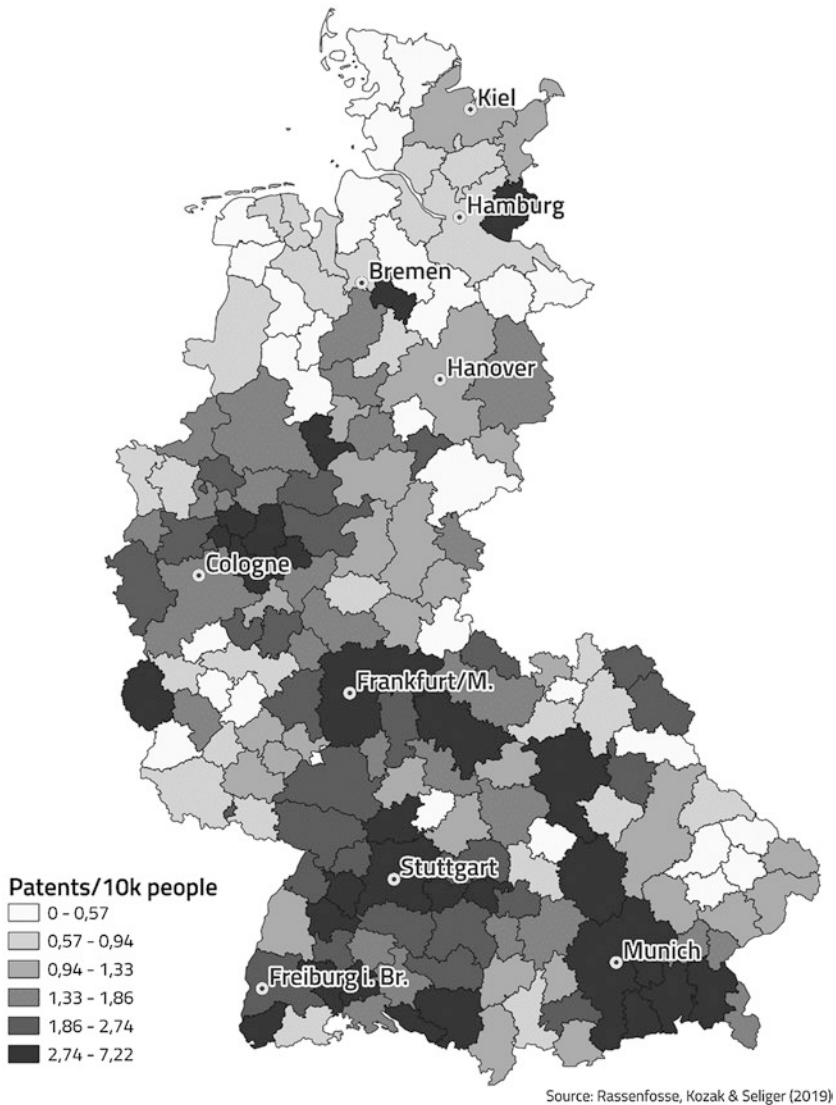


Fig. 4.4 (a) Patents per 10,000 population, 1989—West Germany. Notes: Patents are assigned to regions according to the residence of the inventor. Source: Rassenfosse et al. (2019). (b) Patents per 10,000 population, 1989—East Germany (GDR). Notes: Patents are assigned to regions according to the location of the applicant. Source: Hipp et al. (2023)

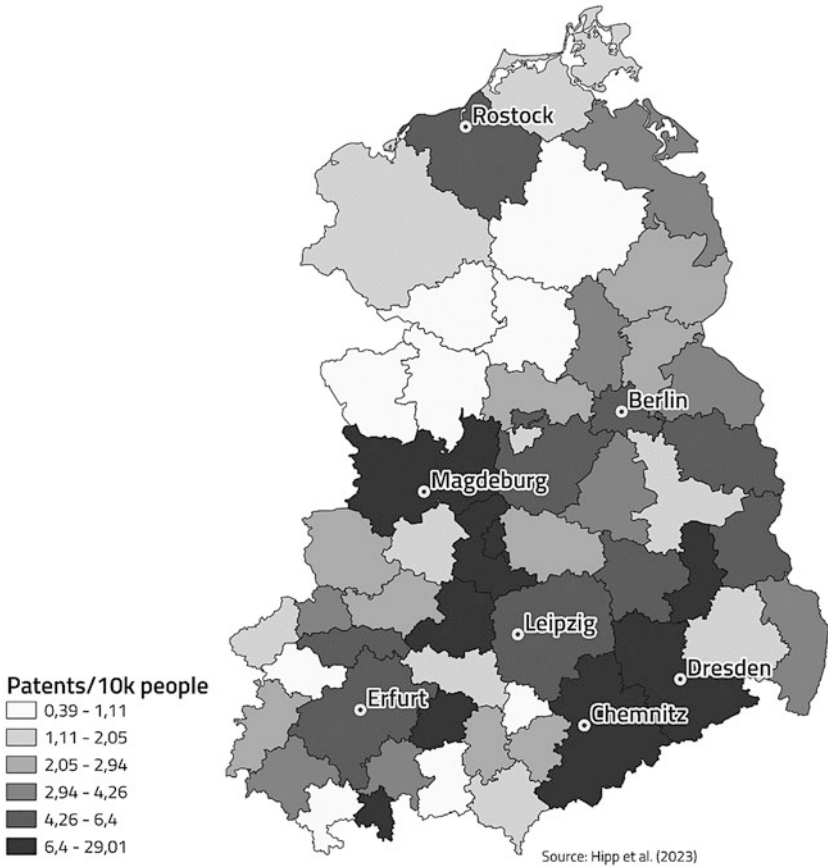


Fig. 4.4 (continued)

regional hot spots of innovation activity in East Germany were already innovation centers before WWII. It is also noteworthy that particularly Dresden and Jena represent “cathedrals in the desert,” where innovation activity is not significantly connected to the surrounding area and creates geographic spillover effects (Fritsch and Graf 2011). Altogether, comparing the regional structures of patenting activity before WWII (1938), at the end of the socialist regime (1989), and in the year 2014 reveals pronounced traces of the socialist regime and of reunification.

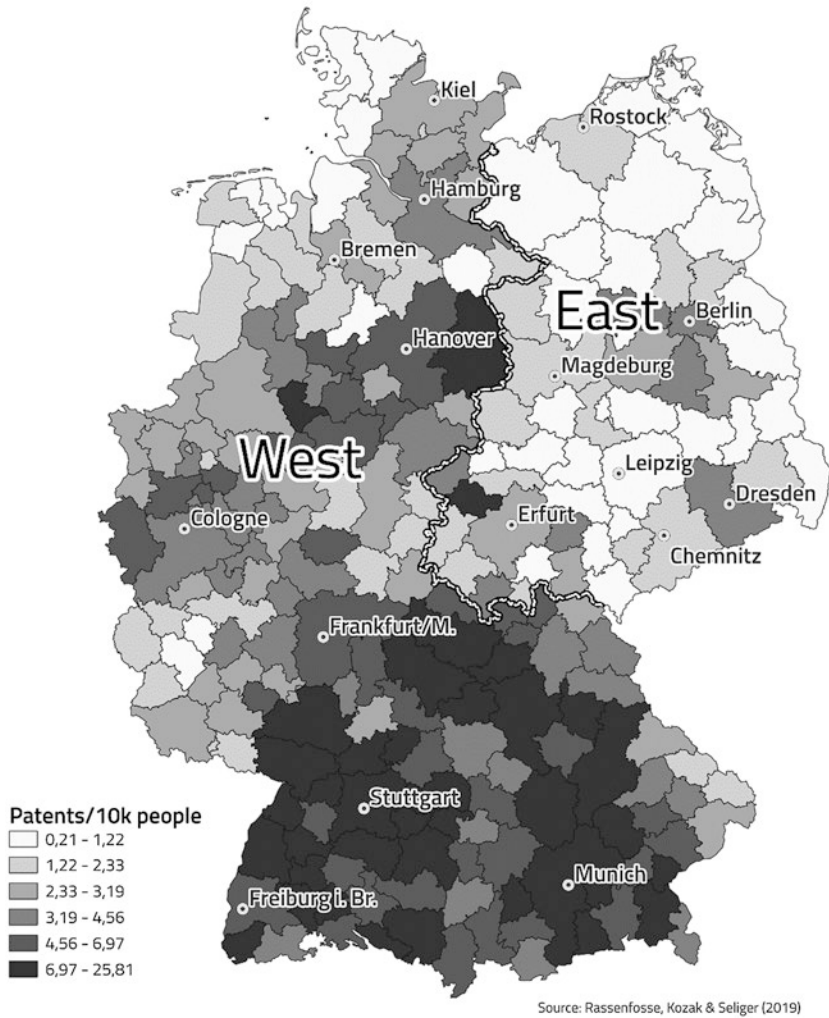


Fig. 4.5 Patents per 10,000 population, 2014. Notes: Solid borders outline the former GDR territories. Patents are assigned to regions according to the residence of the inventor. Source: Rassenfosse et al. (2019)

6 CONCLUSIONS

Investigating the development of patenting activity in Germany from the time before WWII until the year 2014, we find that the 40 years of separation into a capitalist West and a socialist East resulted in significant East–West disparities due to the socialist “treatment” of the East. The reunification of both German states in 1990 and the corresponding integration of the two innovation systems led to increasing levels of innovation activity in both parts of the country up until the mid-2000s. It is nevertheless remarkable that this increase was considerably stronger and more sustained in the West. This indicates that the West German innovation system benefited more from the unification than innovation activities in the East. As a result of these developments, there is increasing divergence in innovation activities in the post-reunification period, with the East falling increasingly behind.

There are several possible explanations for the relatively poor performance of the East German innovation system after reunification. First, during the separation and at the end of the socialist period, the technological profiles of the East and West German innovation systems were highly similar. A main source of this similarity is the common history of East and West Germany as an integrated innovation system in the pre-separation period. Another reason is that the GDR leadership pushed scientists and engineers to catch up with technological developments in Western countries, using West Germany in particular as a benchmark.¹⁰ Because West German research was generally more advanced than that in East Germany, the similarity between their respective technological fields meant that, in most cases, West German R&D projects outcompeted their East German counterparts. Hence, the consolidation of research capacities after reunification was mostly at the expense of East German actors (Fritsch et al. 2023a).

Second, the pronounced migration of East German scientists and engineers to West Germany that took place during the consolidation process in the first few years after reunification may have reinforced specialization

¹⁰A prime example of this is the case of the Carl Zeiss company, a world-leading producer of optical instruments since the nineteenth century. After WWII, this company split into an East German and West German firm. After 40 years of separation into a socialist and a market-oriented environment, Kogut and Zander (2000) show that the technological profiles of both firms remained very similar.

and scaling advantages of innovation activities in West Germany and severely weakened innovation activity in the East (Dorner et al. 2016).

Third, the turbulence caused by the radical restructuring of the GDR innovation system destroyed many established links among actors and hampered the establishment of the trustful relationships necessary for the effective division of innovative labor. Considerable time was also required for the rebuilding of the public administration, the radical reform of the system of higher education, and the reorganization of extra-university public research. It also took quite some time for the institutions of education and research in both parts of the country to become sufficiently integrated. This resulted in a prolonged period during which innovation activity in East Germany suffered from a lower level of “systemness,” that is, a lower level of relational embeddedness and mutual interplay of its political, economic, technological, and cultural systems.

Finally, after 1990, a large part of East German patenting shifted toward technological fields where West Germany had considerably more extensive experience. This specialization may have implied a continuous and growing efficiency advantage contributing to the widening East–West gap in the level of patenting.

Although the empirical evidence clearly suggests that the consolidation of innovation activities, as well as the net migration of R&D personnel from East to West, was largely completed within the first few years after reunification, it is hard to overstate the significance of these two developments in explaining the growing distance between innovation activities in East and West Germany. Moreover, it may require a considerable period of time for the East German innovation system to recover from the radical shock transformation and show the same level of systemness as its long-established West German counterpart (Ruhmann et al. 2022). It is rather remarkable that the massive financial support for innovation activities in East Germany over the last decades has not been able to prevent innovation in East Germany from falling further behind.

Another reason for the lag in East German innovation activity—one frequently cited in the political debate—is that the economy in this part of the country mainly consists of small and medium-sized companies, with only a few large companies as an exception. This argument has some justification, given that large companies often perform important functions in innovation systems as gatekeepers and brokers (Agrawal and Cockburn 2003; Graf 2011). However, it can also be argued that the small-firm structure of the East German economy is a symptom of low economic

performance, ultimately due to the insufficient success of innovation efforts. The dominance of small-scale firms as an explanation for the lag in East German patenting also fails to account for the tendency of smaller firms to file a greater number of patents per unit of R&D input (Cohen and Klepper 1996).

In considering the importance of an effective innovation system for regional development, our analyses yield some important implications for policymakers. First, our findings shed light on the problems related to a disruptive and radical shock transformation of a socialist innovation system into a market-based system. The German example demonstrates that sudden exposure to global competition, combined with a radical reconstruction of institutional structures, may result in long-term low innovation performance. Even massive policy support with high subsidies for innovation activities could not prevent the widening East–West gap regarding innovation activities.¹¹

A further important policy implication of our analysis—one that holds independent of the actual transformation strategy applied—concerns the technological profile. The example of East Germany makes it very clear that a country and region need to develop specific technological competencies to avoid being outcompeted. This is particularly relevant in the context of increasing globalization and interaction among different types of innovation systems. Hence, policy should aim to develop specific knowledge and capabilities to remain competitive and successfully participate in the international division of labor.

There are several limitations to our analyses which provide avenues for further research. Despite finding that technological similarity between East and West Germany explains the development of East–West differences in patenting after 1990, there is room for investigating the underlying mechanisms of this process in greater detail. A further limitation follows from the well-known weaknesses of patents as indicators of innovation activity (Griliches 1990; Nagaoka et al. 2010). Hence, we do not know if our results hold for innovation processes unrelated to patenting, such as the adoption and implementation of new technology. Another open question concerns the effects of the knowledge transfer from the

¹¹This failure casts doubt on hopes for a quick recovery from radical transformation processes. Other former socialist transformation countries implemented strategies that led to much more gradual changes. We are, however, not aware of great improvements in innovation performance in any of these cases (Meske 2004; Radosevic 1998, 2022).

West to the East and the rather generous financial support of East German innovation activities since unification. What was the impact of the public promotion policies, and why were such measures insufficient for preventing an East–West divergence?

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Catching-up Modernization: Synthetic Fiber in East Germany and Poland

Falk Flade

I INTRODUCTION

Research conducted in the 1990s highlights the fact that planned economies in former Eastern Bloc countries were characterized by inherent dysfunctions resulting in considerable development gaps when compared to their capitalist counterparts (see, e.g., Kornai 1992; Balcerowicz 1995). Characteristics such as the lack of competition and barriers to foreign trade resulted in an increasing productivity gap vis-à-vis the West. These characteristics correspond to fundamental features of planned economies, such as socialist ownership, the centralization of decision-making, and information and motivation problems on different system levels (see Buchheim 1995; Gutmann 1999).

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All this leads to a general observation: planned economies underperformed with regard to innovation, that is, technological change resulting in economic progress. Without competition or the pressure to reduce costs, the incentives for companies—which were often protected by a monopoly—to invest in innovation were too weak. The most important goal of company managers was rather to fulfill politically or ideologically motivated plan targets. Risky innovation investments had the potential to thwart plan fulfillment. Investments in technological change, with the West as a blueprint, often had to be decreed by central planners, necessarily resulting in a modernization lag with respect to leading capitalist economies and companies. Besides, the priority of politics over economy increased the risk of allocative inefficiency (Hanson and Pavitt 1987, 19; Gomułka 1990, 97–98).

To shed greater light on modernization attempts at the micro and meso levels of planned economies, this chapter focuses on the synthetic fiber plants in Guben, East Germany, and Gorzów, Poland.¹ The plant in Guben was part of a large-scale modernization program in the chemical industry of Eastern Bloc countries. In 1956, this segment received its own Standing Commission at the international Council of Mutual Economic Aid (CMEA), with headquarters in East Berlin. In February 1958, East Germany and the Soviet Union reached an agreement on the delivery of Soviet raw materials to East Germany and the delivery of East German chemical end products back to the Soviet Union (Karlsch 1999, 292). In summer 1958, the Soviet Union decided to implement a chemicalization program, which was followed by a similar step in East Germany. CMEA countries also reached a decision to construct a transcontinental crude oil pipeline in December 1958 (Neumann 1972, 264–265). However, this did not result in a complete turn to the new and more efficient feedstock oil. The ambivalence between the traditional domestic carbochemical industry and the modern petrochemical industry was one of the characteristics of East Germany's chemicalization program and can be interpreted as a barrier to swift and efficient modernization (Schröter 1996, 113).

The chemical industry received increased political attention in the 1950s and 1960s not only because politicians in East Germany and the Soviet Union understood that they were falling behind the West, but because—in contrast to the Stalinist focus on coal and steel—Ulbricht,

¹ Instead of the more accurate terms “German Democratic Republic” and “Polish People's Republic,” this chapter will use the words “East Germany” and “Poland” instead.

Khrushchev, and others were hoping that the dynamically developing chemical industry would become a new field of rapid economic and social progress. Plastic technologies for the mass production of clothes, furniture, kitchens, and cars were meant to become the entry point for a distinctly socialist consumer culture (Rubin 2008, 10–11). According to the East German leadership, the chemical industry in particular—as part of a socialist plan economy—had the potential to successfully compete with the West. East Germany was thus explicitly asking the Soviet leadership for additional scientific and economic support in this field (Hoffmann and Malycha 2016, 80).

This industrial policy had an undeniable impact on the synthetic fiber plants. They were subject to central planning and exhibited fast output growth. However, since the late 1960s, they had already become increasingly reliant on the import of Western technology to keep pace with international standards. Similar to East Germany, the Polish chemical industry became subject to a broad modernization program. However, the Polish chemicalization program was adopted only in 1973, that is, 15 years later than in East Germany (Pojda 1974, 343). Due to the approaching economic crisis, most of the planned activities were not implemented. In the transformation period, both factories were forced to significantly reduce their workforce and product range but managed to survive.

The remainder of this chapter explores the following three questions: What kind of modernization barriers did both plants encounter? Were there significant differences between the two? In which way did these conditions influence the further development path of both plants in the transformation period? The chapter will pay special attention to investment, technology, and the workforce structure, as well as innovation output.

2 EMPIRICAL CASE STUDIES: CHEMIEFASERWERK GUBEN AND STILON GORZÓW

The synthetic fiber plant Chemiefaserwerk Guben (CFG) was established in the late 1950s as part of a large-scale development program for the chemical sector. This chemicalization program designated considerable investments for the extension of existing plants such as Leuna or Buna that traditionally focused on coal as a feedstock, but also the construction of new plants, including an oil refinery and a synthetic fiber plant using Soviet crude oil as a feedstock. The decision to place the new synthetic fiber plant

in Guben was based on the advantageous infrastructure at the proposed site in the city's south, but also the region's textile tradition and various political considerations (Gayko 2000, 161).

Although the initial planning for the synthetic fiber plant started already in 1956, it was the development of new crude oil fields in the Soviet Union as well as closer international cooperation in Eastern Europe that made East Germany's chemicalization program possible (Stokes 2000, 84–85). As in other cases, however, the entire planning and construction process of CFG was plagued by delays amounting to several years and serious setbacks for the realization of the larger chemicalization program (Gayko 2000, 71).

The beginnings of the synthetic fiber plant in Gorzów can be traced back to the late 1930s, when the German dyestuff producer IG Farben built a factory to produce the polyamide fiber Perlon in the city of Landsberg an der Warthe. Here, the link to the prewar period is more obvious than in the case of CFG. Nevertheless, in both cases, the technology was based on experiences and led by experts from the interwar period. This is true not only for the synthetic fiber industry but also for most economic branches which saw a relatively swift postwar reconstruction (Bahr 2001, 41; Grabas 1995, 153–154). After the Second World War, the factory lost up to 80 percent of its asset value, mainly due to war compensation to the Soviet Union as well as shipments to other Polish factories under reconstruction (Hempel 1998, 249). After some years of reconstruction and extension, the factory was officially opened under the name Gorzów Synthetic Fiber Factories (Gorzowskie Zakłady Włókien Sztucznych) by the Polish Prime Minister Józef Cyrankiewicz in 1951. In 1971, the factory received the name “Stilon,” which is used throughout the remainder of this chapter (APG 37/13/570, 57, 70).

2.1 *Investments*

Investments are an essential part of every modernization endeavor. In the beginning, a considerable share of investments is spent merely to extend the factory or its workforce, that is, for extensive growth. Modernization investments in the narrow sense of intensive growth are associated with raising labor productivity through the implementation of new technology. Overall investments can nevertheless give an idea of the political priority given to a factory or branch. Regarding CFG, the second half of the 1960s saw the largest overall investments, whereas investment at Stilon peaked in

the first half of the 1970s. In general, both cases were characterized by overambitious development plans, whose targets were often missed.

As mentioned above, CFG was a typical example of a hasty and politically induced launch of a new branch. As part of the chemicalization program from 1958, it was the second-largest new construction project after the oil refinery in Schwedt. At that time, the exact location of these new plants was still undecided. Table 5.1 shows that planned investments for the extension of existing chemical plants in Leuna and Buna were only slightly higher.

In the following years, these initial numbers were subject to constant changes, resulting in considerable delays in starting production, and in production outputs well below target (BArch DE 1/770, 216; BArch DC 20/7271, 12).

Material presented at a meeting of East Germany's Research Council (Forschungsrat) in 1965 shows that actual investments for the first construction phase surpassed the planned 505.2 million DM and reached 579 million DM, with a share of 203 million for construction work. For the second construction phase, with an envisioned completion in 1972, an additional 522 million DM were earmarked. Here, the share of construction work was meant to be lower, which indicates that a purchase of expensive high technology was planned (BArch DY 30/78871[a], 2).

The entire construction process was plagued from the very beginning by significant delays, resulting in considerable disproportions. Whereas production capacities did not reach the planned levels, the necessary

Table 5.1 Planned investments for construction work as part of the chemicalization program until 1965

	<i>Administrative district</i>	<i>Investments (in million DM^a)</i>
Extension		
Leuna	Halle	250
Buna	Halle	250
New construction		
Erdölverarbeitungswerk	Frankfurt/Oder [Schwedt]	310
Chemiefaserwerk	Cottbus [Guben]	235

Source: BArch DC 20-I/3/292. Dokumente und Materialien der 50. Sitzung des Ministerrates der DDR vom 13. Nov., 8. und 18. Dezember 1958: Programm der Entwicklung der chemischen Industrie bis 1965, 38

^aEast Germany's currency had the following units and abbreviations: Deutsche Mark (DM) from 1948 to 1964, Mark der Deutschen Notenbank (MDN) from 1964 to 1967, and Mark (M) from 1968 to 1990.

support facilities such as energy production, workshops, storage capacities, transport, and social infrastructure were more or less punctually in place and lowered the productivity of the entire plant, since these fixed costs could only be spread across relatively limited production. Economies of scale and mass production—which are among the primary aims of planned economies—were thus insufficiently realized (BArch DG 11/386, 10).

Because the largest production increase for synthetic fiber was planned for the second half of the 1960s, more investments were needed in this period. Until 1970, 1.3 billion DM had been earmarked for reconstruction, extension, and new construction in the entire industry. Out of this, more than 700 million DM were meant for the construction and extension of production capacities at CFG as well as the synthetic fiber plant in Premnitz. Table 5.2 highlights that investments in Guben were more than twice what they were in Premnitz.

These numbers also show that the second construction phase at CFG was meant to start in 1969. Consequently, investments were planned to significantly increase in the 1970s. However, due to considerable delays in the first construction period, these investments had to be postponed. In 1964, it was planned that investments would amortize until 1971 (BArch DC 14/10799, S. 3). However, the mentioned changes regarding production output and structure resulted in considerable cost explosions. Consequently, the payback period grew from seven to ten years (BArch DY 30/78871[b], 3–4, 9). Table 5.3 shows that the second investment peak shifted by around five years from 1974 to 1979 but did not reach the investment amounts of the 1960s.

These numbers also show that investments at the second construction phase were meant to focus on the purchase of technology (intensive growth) and not the mere extension of production capacities (extensive

Table 5.2 Planned investments at the production sites in Guben and Premnitz in million DM, 1964–1970

	1964	1965	1966	1967	1968	1969	1970	overall
Guben	120	104	95	60	20	50	100	549
/construction	40	40	23	10	10	30	35	188
Premnitz	–	10	35	70	70	25	25	235
/construction	–	5	20	20	15	10	10	80

Source: BArch DE 1/61539, 4–5

Table 5.3 Planned investments at CFG in million Mark, 1970–1977 and 1976–1980

	1970	1972	1974	1977	1976	1977	1978	1979	1980
Investments	105.5	149.4	260.0	107.9	59.5	89.4	140.3	191.7	115.5
/construction	–	–	–	–	16.2	20.6	20.6	21.7	21.0
Equipment	–	–	–	–	31.3	55.6	89.5	133.0	75.0

Source: 1970–1977: BArch DG 11/386, 3; 1976–1980: BLHA 903 326. Staatliche Aufgaben des Fünfjahresplanes 1976–1980 für VEB Chemiefaserwerk “Herbert Warnke” Wilhelm-Pieck-Stadt Guben. Rudolstadt-Schwarza 05.03.1976, 4

growth). Such “intensification” should be reached through an increasing effectivity of capital assets (*Grundfonds*) (BLHA 903 763, no pagination). In the 1980s, however, the aim seemed to be a minimization of investments while further increasing production output. This was in line with the overall economic situation. The growing debt burden and increasing difficulties to obtain loans in convertible currencies resulted in another synthetic fiber program aiming at decreasing Western imports (BArch MfS HA XVIII 6804, 2). However, the implementation of this program, together with one of its key topics—the further change in production processes from imported dimethyl terephthalate to domestically produced purified terephthalic acid—was seriously hampered (BArch DY 30/38642[b], no pagination).

The general shift of political attention toward microelectronics in the late 1970s also diverted or detracted necessary investments away from the synthetic fiber and chemical industries (Schröter 1996, 124). Consequently, the combination of missing investments and expected production increases led to diminishing quality and adversely affected customers’ production in the 1980s (BArch MfS BV Cottbus AKG 6556, 228, 231).

The main difference between the investments at CFG and Stilon was that investments at Stilon picked up speed more slowly and reached a peak roughly five years later. This underscores that CFG was a hasty and politically induced kick-start project aiming at closing the development gap with Western technology leaders as quickly as possible. Stilon, on the other hand, was developed more gradually, without the political pressure of keeping pace with leading tech countries. The political decision to considerably modernize the factory was made only in 1966 (APG 37/13/459, 76). As mentioned, a chemicalization program with a broad impact was adopted in Poland only in 1973. Due to the upcoming economic crisis in

the second half of the 1970s, this program could not be implemented and had no measurable effect on investments. Table 5.4 shows how investments grew slowly over the decades and reached a peak in the early 1970s. The yearly numbers in the lower part of the table highlight that the largest investments were made in the first half of the 1970s.

The unorthodox periodization in Table 5.4 is based on Hempel's description of general development stages at Stilon. Table 5.5 shows planned investments at Stilon for every five-year plan period, again demonstrating that investments took off slowly and gathered speed only in the late 1960s.

Table 5.6 completes this picture with planned investments for the 1970s and 1980s. It also gives an idea of Stilon's share in overall investments in the Polish synthetic fiber industry. Similar to CFG, Stilon was one of the main investment locations. The numbers show, however, that investments were planned to decrease in the 1980s since the extension of Stilon was meant to be completed.

Given that Table 5.6 refers to planning from 1972, it is very likely that these investments—especially in the 1980s—were not met. When

Table 5.4 Investments at Stilon in million zloty, 1949–1980

I stage (1949–1959)	649
II stage (1960–1968)	962
III stage (1965–1973)	2683
IV stage (1971–1980)	10,600
Overall	14,894
1970	551
1971	505
1972	1133
1973	1875
1974	2449
1975	1672
1976	889
1977	381
1978	215
1979	127
1980	62
Overall	9859

Source: Hempel (1998, 253, 255, 258, 261)

Table 5.5 (Planned) investments at Stilon in million zloty, 1956–1970

	1956–1960	1961–1965	1966–1970 (plan)	1966 (plan)	1967 (plan)	1968 (plan)	1969 (plan)	1970 (plan)
Overall	616.0	731.6	2206.0	71.6	314.7	508.0	1018.1	293.6
/construction	291.8	278.5	700.8	700.8				

Source: APG 37/3/90, no pagination

Table 5.6 Planned investments in the synthetic fiber industry in million zloty, 1971–1990

	1971–1975	1976–1980	1981–1985	1986–1990	Overall
ZWS “Wistom” Tomaszów	1085	758	30	33	1906
ZWS Chodaków	303	631	459	609	2002
ZWS “Anilana” Łódź	373	846	69	69	1357
ZWS “Celwiskoza” Jelenia Góra	455	2819	4114	6411	13,799
ZWS “Wiskord” Szczecin	354	973	799	966	3092
ZWS Wrocław	143	308	90	30	571
ZWS “Stilon” Gorzów	8934	7366	2670	–	18,970
ZWS “Elana” Toruń	8546	7233	–	–	15,779
ZWS Piła	266	19,982	12,631	12,709	45,588
Nowy Zakład PAN	–	1100	3818	4096	9014
Overall [own calculation]	20,459	42,016	24,680	24,923	112,078
Overall investments in the synthetic fiber industry	20,918	42,252	25,023	25,083	113,276
/construction	9025	16,652	7805	8813	42,295

Source: APG 37/12/378, 8, 12–22

comparing to Hempel’s accounts from the mid-1980s,² even for the 1970s there seems to have been a large difference: around 10,000 million zloty (Table 5.4) versus a planned 16,300 million zloty (Table 5.6). The first half of the 1970s under the rule of Edward Gierek, the newly elected first secretary of the ruling Polish United Workers’ Party, saw a policy shift toward Western technology imports to modernize the entire country. This policy of purchasing complete Western plants on credit with the aim to pay back the loans using future export revenues nevertheless failed due to changing financial conditions on global markets after the first oil crisis.

²Hempel’s book was published in 1998 but is completely based on material from the mid-1980s.

This resulted in a considerable debt crisis in the early 1980s and, consequently, falling investments in the entire Polish economy (see Poznański 1986).

Both companies were nevertheless the targets of large investments in the 1960s and 1970s. The main reason for these large allocations to CFG and Stilon was that both plants were the only (Stilon) or by far the largest (CFG) producers of polyamide fiber, which made up a large share of production growth in the overall synthetic fiber industry (BArch DE 1/27850, 34–35; Hempel 1998, 48).

2.2 *Technology Level*

The production of polyamide fiber was crucial for both companies. CFG also produced polyester fiber starting in 1972, which interestingly had been planned from the very beginning. Due to the inability to develop the necessary production technology itself, however, the political leadership decided in 1967 to import the technology from the West (BArch DC 20/7271, 11–12; Knappe et al. 2009, 22–23). Other products like bristles or fishing line yarn made up a relevant part of the product portfolio of both companies, but did not require high technology. Stilon also successfully produced magnetic tapes, although this accounted for only a small share of overall production. Table 5.7 shows the year of production start of the most important synthetic fiber types.

Most of the core products were produced earlier at Stilon, but the commencement of large-scale production lagged behind CFG, often by several years. This is in line with findings in Sect. 2.1 regarding the timing of investments. Nevertheless, the general timelines of the introduction of new fiber types and the related technology are about the same. Due to the later introduction of new production technologies, Stilon was able to skip intermediate developments such as large-scale production of polyamide fine silk without extruders. In the 1970s and 1980s, modernization attempts in both plants focused on automation, rationalization, and intensification of existing production technologies (BLHA 903 679, 1; APG 37/13/459, 31–32).

Putting into operation new production lines was closely connected to modernization achievements on a more specialized level. These incremental innovations, such as the reuse of wastewater (depolymerization) and the improvement of production processes or extension of the product

Table 5.7 Production start of different types of synthetic fiber at CFG and Stilon in general/on a large scale

<i>Fiber type</i>	<i>Operation start CFG</i>	<i>Operation start Stilon</i>
Polyamide fine silk production	1965	1951/1968
Polyamide corduroy	1969	1956/1970
Polyamide carpet yarn	1969	1972/1975
Polyester	1972	–

Source: BArch DC 20/9664, 13–14. APG 37/13/459, 76–79

portfolio, took place at both companies (Bode 1998, 166; Krause et al. 2009, 69; APG 37/13/459, 37).

Starting in the late 1960s, foreign technology suppliers became more important for both plants. Interestingly, large-scale contracts with West German machine-building companies like Vickers-Zimmer from Frankfurt/Main for the delivery of production facilities worth 5.4 million Marks were made despite the policy of “Störfreimachung,” that is, the replacement of Western imports in favor of national or Eastern European suppliers in order to become more economically independent (BArch DG 11/2541, no pagination). However, these imports of Western technology posed potential challenges. Whereas other sectors of the Eastern European industry were directly affected by the Coordinating Committee on Multilateral Export Controls (CoCom) embargo, synthetic fiber technology did not seem to be restricted by it. However, the reliability of Western technology suppliers was an issue that arose regularly, and not only in the synthetic fiber industry. Cases of noncompliance by Western technology suppliers are frequent in the archive material (e.g., BArch MfS BV Cottbus 7811, no pagination; BArch MfS HA XVIII 30226, no pagination; BArch MfS HA XVIII 13212, 13–14). East Germany’s legal bodies likely did have problems regarding legal reinforcement in the West. However, internal analyses of the ministry of state security concluded that the institutions and persons responsible for foreign trade contracts regularly acted in a way that was “mindless and gullible” (BArch MfS BV Cottbus Abt. AKG 7912).

Technology imports from Eastern European partners suffered their own set of obstacles. A constant problem was the rather low reliability of Eastern European supplies, even if formally agreed by central planning bodies (BArch MfS ZAIG 2283). This, in turn, forced ministries or factories in East Germany to conduct ad hoc imports from the West or to start

inefficient small-scale production themselves. Another issue was the slow implementation of relevant R&D results. The close scientific-technical cooperation between research institutes from East Germany and the Soviet Union in the field of synthetic fiber can serve as an example here. After six years of cooperation, promising results regarding fast-spinning technology by leaving out several work-intensive intermediate steps were achieved in 1975. In comparison to the standard method, the new process resulted in a decrease in energy costs by 12 percent, a decrease in material consumption by 20 percent, and an increase of labor productivity by 300 percent. However, due to supply problems from other East German factories regarding the necessary machinery equipment for large-scale production, production could not start before 1980 (BArch DY 30/38571, 2–3).

Aside from these examples of at least partial success, cooperation with Eastern European partner institutions was mostly confined to the bilateral exchange of knowledge. Here, CFG was in contact with all relevant synthetic fiber factories in socialist countries, such as Chimvolokno Chernigov, Chimvolokno Mogilev, Vidlon Vidin, Chemlon Humenné, and Stilon Gorzów. Due to the proximity of CFG and Stilon, at least in the early 1970s, Polish delegations to CFG were the largest in terms of participating persons as well as visiting days (BLHA 903 815, no pagination). In later years, however, the contact between CFG and Stilon seemed to become looser, which, at least after 1981, could be attributed to the general political environment (BLHA 903 815, no pagination; BLHA 903 145, 7).

As mentioned above, the political decision to modernize Stilon was made in 1966. Similar to CFG's development, this modernization attempt was based on a license for high-quality polyamide fiber from the Italian company Snia Viscosa, with production starting in 1968. Later, the further modernization of existing production technologies was based on licenses from Toray Industries in Japan for polyamide fine silk and the West German Barmag-Zimmer for polyamide carpet yarn, with production starting in 1975. These licenses for fundamental production processes were complemented by other licenses or machinery imports from Western companies such as Garbato, Agfa-Gevaert, Reifenhäuser, or Zinser (Hempel 1998, 253–259).

However, there were cautious voices at Stilon that argued in favor of extending in-house R&D capacities. They warned against trying to leave out research steps by buying high-tech solutions abroad, which would lead to the loss of fundamentally understanding technology options

(Trojecki, 2012, 89–90). Consequently, Stilon was one of the companies that at least tried to avoid high-tech imports from abroad from the beginning of the 1970s onward. As in the case of East Germany, this was part of a larger policy of import replacement (Trojecki, 2012, 117). Stilon had had negative experiences with delayed delivery by the high-tech supplier Snia Viscosa, which agreed to pay a delay penalty of 228,000 US dollars in 1969 (AAN 1154/0/38/77, 2–3). This experience likely impacted the decision made in 1972, favoring Toray Industries over Snia Viscosa (AAN 1154/0/67/124, 11).

Table 5.8 shows that, in line with the general investments for the purchase of machinery and equipment, investments for technology imports declined significantly in the second half of the 1970s. The share of machinery imports, especially from the West, decreased significantly after 1974.

The general economic downturn in Poland starting in the mid-1970s resulted in a halt to modernization at Stilon and an end to the general chemicalization program adopted in 1973. Production output was meant to stagnate, whereas the quality of products should improve gradually (APG 37/12/379, 4). Despite considerable investments made between 1966 and 1975, the machinery park was fairly outdated, with more than 50 percent written off in 1983. This also meant that spare parts were either costly to import or even no longer available (APG 37/12/379, 33; APG 37/13/459, 40). Due to the modernization policy between the mid-1960s and mid-1970s, however, a large share of Stilon's machinery suppliers were abroad. Out of 240 suppliers, 62 were in West Germany, 39 in Italy, 21 in the US, 18 in England, 16 in Japan, 14 in East Germany, 9 in Switzerland, and only 35 in Poland (APG 37/13/459, 35).

2.3 *Workforce Structure*

The implementation of modernization efforts due to investments and technology is closely related to the workforce of a given organization. A proper education level among at least parts of the workforce is crucial for efficient implementation. Besides, the R&D workforce is a common yardstick in innovation research to measure the input of resources to increase innovation output (see Sect. 2.4).

Figure 5.1 shows the overall development of the workforce at CFG and Stilon. After a continuous increase at Stilon in the first 15 years, a plateau was reached in the mid-1960s. The governmental decision in 1966 to further extend the plant led to a swift employment increase in the

Table 5.8 Investments for the purchase of machinery and equipment at Stilon in zloty, 1972–1979

	1972	1973	1974	1975	1976	1977	1978	1979
Overall	433,201	1,114,721	1,436,960	975,371	418,216	63,661	70,783	57,239
/import in %	84.4	90.0	64.9	62.7	56.1	5.9	9.3	4.2
/import from capitalist countries in %	77.1	82.7	52.8	53.4	12.3	7.0	6.0	4.2

Source: Trojecki (2012, 95)

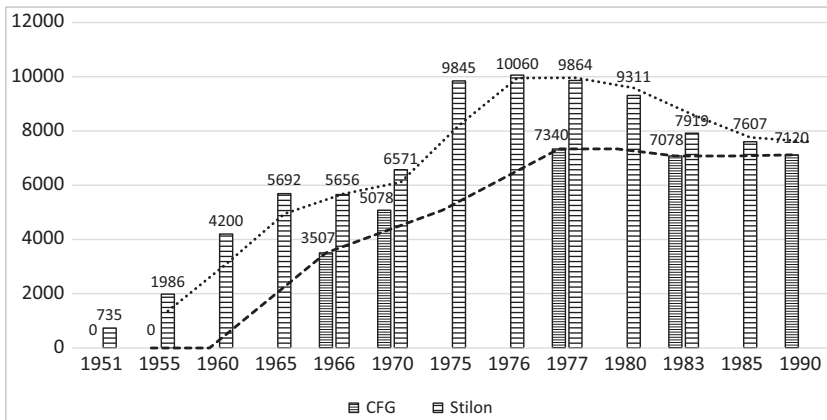


Fig. 5.1 Overall employment at CFG and Stilon, 1951–1990. Source: CFG 1966: BArch DG 11/273, no pagination. 1970: BLHA 903 681, 8, 1977: BArch DC 20/9664, 15, 1983: BLHA 903 206[a], 4, 1990: BLHA 903 853, no pagination. Stilon 1951–1985: APG 37/13/459, 42

following decade. After a peak in 1976, a slow decline set in. Similarly, the first 15 years at CFG were characterized by a steady increase in overall employment. Like at Stilon, however, a stagnation set in in the mid-1970s. The dotted trend lines highlight the overall development.

The majority of these employees were production workers hired within the region. In CFG's case, around two-thirds of employees were meant to be women, which was in line with the region's tradition in the textile industry. In later years, workers were also recruited from other parts of the country and abroad due to East Germany's chronic lack of labor. In the beginning in 1966, the first 250 Polish employees arrived at CFG on the basis of a bilateral agreement between East Germany and Poland (BArch DC 20/4582, 6–7). Up until 1970, the Polish workforce consisted of around 1000 persons. This was mutually advantageous. The Polish side was able to provide its population in the border region with well-paid jobs, whereas East Germany side could fill in labor gaps without the necessity to provide them with permanent housing (BArch DC 20/18439, 4–5). Not least because of the political turbulence in the beginning of the 1980s, the size of the Polish workforce did not increase further, but rather was complemented by individuals from Vietnam, Cuba, and Mozambique. In mid-1983, out of a total of 7078 employees at CFG, there were 1498

workers from abroad, of which two-thirds were from Poland (BLHA 903 206[c], 1). Regarding Stilon, there is no information about the employment of foreign persons on a large scale before 1990.

The synthetic fiber industry is situated between the research-intense chemical industry (supplies) and the rather low-tech textile industry (customers), but also light and heavy industries (tires, conveyers). Hence, well-educated graduates in chemistry, textile technology, and machine building but also mathematicians, economists, and lawyers were needed (BLHA 903 681, 9). In the case of CFG, these graduates were recruited at the large technical universities in Dresden and Karl-Marx-Stadt, but also smaller technical colleges in Forst, Köthen, and Halle. There were also constant endeavors to upgrade the education level of the existing workforce. Table 5.9 shows the numbers of what were called “*Hoch- und Fachschulkader*” (i.e., graduated specialists) at CFG. At least in the given time period, a peak of R&D personnel was reached in the mid-1970s.

These graduates were employed in all production units of CFG, but mainly in the R&D division established in 1963. The highest numbers of employees were reached here in the 1970s, with up to 550 persons, although only roughly one-third of them were graduates (BArch DG 11/273, no pagination). A considerable share of them were also employed in production units (BArch MfS BV Cottbus Abt. AKG 6562, 260; Knappe et al. 2009, 77). The issue of employment being incommensurate with education level was also the case at Stilon (Trojecki, 2012, 142). Especially with regard to the employment of graduates in simple production processes, the lack of labor seems to be a common phenomenon that was not confined to the synthetic fiber industry in East Germany and Poland. The matter also reflects access restrictions to higher education and subsequent declining numbers of students in East Germany after 1969 (Fraunholz 2003, 59–60).

Table 5.9 Overall amount and share of university and college graduates at CFG, 1966–1981

	1966	1970	1973	1977	1981
University graduates	123	224	328	1011	383
Technical college graduates	272	422	758		631
Share of graduates in the entire workforce	11.3%	12.7%	14.2%	14.8%	–

Sources: 1966: BArch DG 11/273, no pagination. 1970, 1973: BLHA 903 681, 9. 1977: BArch DC 20/9664, Informationsbericht, 15. 1981: BLHA 903 206[a], 3

Regarding the share of graduates in the entire workforce at Stilon, the numbers seem to be quite similar to those at CFG. At the end of 1980, the number of white-collar employees (*pracownicy umysłowi*) reached 1132 out of an overall workforce of 9311 (APG 37/1.5/61, 3–4; Hempel 1998, 269). This is a share of 12 percent, which is quite similar to the share of 14.8 percent at CFG in 1977 (see Table 5.9). In contrast to CFG, however, Stilon’s R&D section, established in 1958, employed only 109 persons in 1985, of which 42 were white-collar employees (APG 37/13/459, 37). This is only around one-fourth of the official number of graduates in CFG’s R&D unit.

2.4 Innovation Output

The innovative power of a system can be measured through its patenting. However, patents as an innovation output are not unproblematic, especially in the context of planned economies, whose innovation systems have distinct characteristics. First, there were two types of patents in East Germany: the “exclusion patent” (*Ausschließungspatent*), which secured for the inventor the full property rights of an innovation, and the “economy patent” (*Wirtschaftspatent*), which did not (Wiessner 2015, 256, 259). Second, there were specific modes of innovation, such as activist movements or the innovators movement (“*Neuererbewegung*”), which mainly focused on raising labor productivity, but also incremental innovations (Flade 2022). Third, results of innovation were regularly left unprotected, at least abroad.

The reason for this was a mixture of neglect and economic constraints. Complaints about incapable offices responsible for property rights were common throughout the entire period (BLHA 903 558, 1–2; BArch DF 3/2485, 12–13; BArch MfS BV Cottbus Abt. AKG 6557, 236–237). Besides, costly patenting in the West was not always decisive, since large shares of exports went to socialist countries (BArch DE 4/20074, 3). With regard to patenting in Eastern Europe—the destination of a large share of exports—patenting as an effective means to protect but also share innovation was hampered by legal and monetary dysfunctions. Although an official agreement had been reached at the CMEA’s second meeting in August 1949 in the Bulgarian capital Sofia, resistance to the free exchange of technical documentation and to scientific-technical cooperation endured. Technologically well-developed countries like Czechoslovakia and East Germany were especially opposed to such an agreement. East

Germany thus restricted the free exchange starting in 1953, and after 1956 almost completely canceled it with the argument that this kind of cooperation would endanger exports (Herzog 1998, 15).

Regarding CFG, starting in the 1970s, the numbers of patent applications at the East German Patent Office (*Amt für Erfindungs- und Patentwesen*, AfEP) stabilized at around 30 per year. This amount was in line with comparable factories in Eastern Europe (BArch DC 20/9664, 29). However, some of the granted patents were not used at all. In a report from 1978, all five patents not in use anywhere in the chemical industry in East Germany were held by CFG (BArch DY 30/38642[a], no pagination). This can be attributed to problems in transferring research results into production. The majority of granted patents, on the other hand, were incremental innovations to improve the production process and were unproblematic to implement (BLHA 903 342, 2).

In the beginning of the 1980s, decision-makers pushed to increase the innovation output and implementation at CFG and throughout the synthetic fiber industry. The number of CFG's patent applications was meant to increase from around 30 to 50 in 1984 and 57 in 1985 (BLHA 903 206[b], 1–2).

Figure 5.2 shows the number of granted patents in East and West Germany documented in the database of today's German Patent and Trademarks Office (*Deutsches Patent- und Markenamt*, DPMA), according to the date of application. Almost all of the 117 documented patents are economy patents, awarding the inventor with a payment but not property rights. A significant increase is visible in 1984 and 1985, but appears to be a flash in the pan, with numbers falling again in the years that follow. Furthermore, the very short period between the abovementioned innovation output targets and the swift increase in granted patents indicates that innovation output was politically, and not technologically, induced.

Regarding Stilon, the general background for innovation was similar to that at CFG. A large share of innovations was related to the rationalization of production processes and, therefore, aimed at increasing labor productivity. The specific modes of innovation such as the rationalization movement (*ruch racjonalizatorski*) partially led to adverse incentives, where companies and inventors strove foremost to fulfill plan targets or increase personal incomes (Trojecki 2012, 165).

Nevertheless, there were genuine innovations resulting in stable numbers of patenting. Figure 5.3 shows the number of patent grants according to the year of registration at the Polish Patent Office (*Polski Urząd*

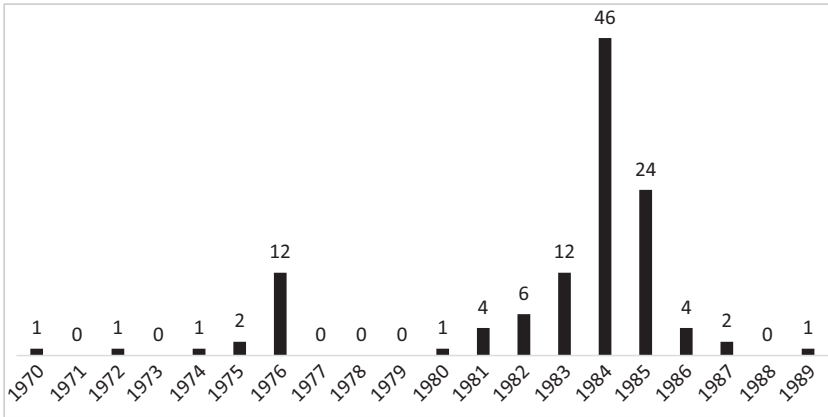


Fig. 5.2 Patent grants for CFG documented in the database of the DPMA, 1970–1989. Source: <https://depatisnet.dpma.de/DepatisNet/depatisnet?window=1&space=menu&content=index&action=index> accessed August 5, 2020

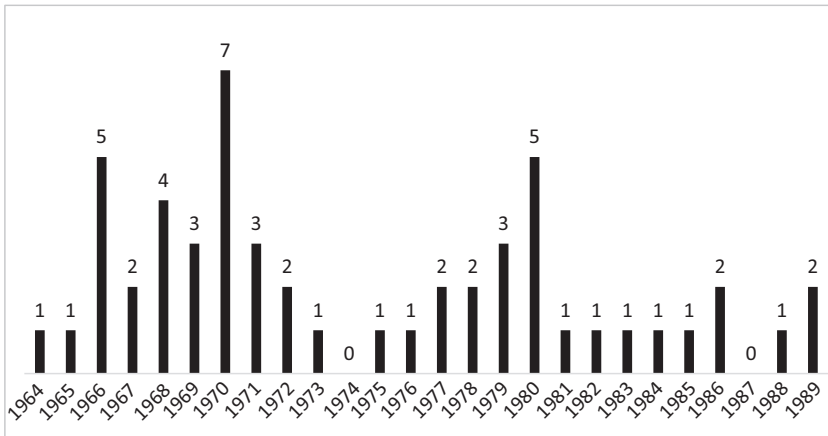


Fig. 5.3 Patent grants for Stilon documented in the database of the Polish Patent Office, 1963–1989. Source: <https://ewyszukiwarka.pue.uprp.gov.pl/search/simple-search> accessed December 10, 2022

Patentomy). The numbers highlight that the late 1960s and late 1970s saw the largest amounts of patent grants. This is in line with the investment increases after 1966 and the implementation of foreign technologies in the first half of the 1970s.

3 TRANSFORMATION PERIOD

In the 1980s, both CFG and Stilon entered a stage of stagnation with regard to investments and overall employment. This had a direct effect on the technology level as well as innovation output. In 1990, the management at CFG made the first steps toward a significant reduction of workers as well as (re)establishing contacts with potential investors in West Germany. Employment was reduced by way of early retirement schemes, gratuities especially for the large Polish workforce, reduced working hours, and dismissals. In 1990, 1260 people were dismissed, 280 of them working pensioners, 620 foreign employees, and 360 East Germans, especially well-educated staff. In the following two years, 2300 more persons were planned to be dismissed to achieve a sustainable workforce number comparable to Western standards. As a result, overall employment was reduced by 50 percent, from 7120 in March 1990 to 3500 at the end of 1992 (BLHA 903 853, no pagination). Due to collapsing sales in the domestic and Eastern European markets, further significant cuts in production output and, consequently, workforce numbers were necessary. Employment numbers were already decreasing, because socialist factories had provided employees with a whole range of social services such as housing, shops, medical care, or kindergarten and schools, which were swiftly outsourced in the early 1990s.

Regarding potential investors, contacts were (re)established with the West German company Hoechst, whose subsidiary Uhde had delivered a production line for polyester contracted in 1969 (Knappe et al. 2009, 19). CFG was split into several smaller units in order to facilitate the privatization process. Due to considerable overcapacities in the Western European synthetic fiber market, however, the outlook was rather unfavorable. Starting in the 1970s, there existed considerable overcapacities which were tackled in the following decades by EU legislation. West German production capacities nevertheless stood at only 75 percent in the late 1980s (Knoll 2022a, 440). Hoechst was planning to take over core parts

of CFG, especially those pertaining to its polyester production. Due to the collapse of traditional outlets in the East, however, the purchasing agreement between Hoechst and the Treuhand, which was responsible for the remnants of the former CFG, was signed only in December 1991. Alongside Hoechst Guben GmbH, Lausitzer Teppichfaser GmbH was established. Meanwhile, the electricity production was sold as Energiewerk Guben to the regional electricity company ESSAG, which later became part of the energy company RWE (BLHA 903 851, 7).

In the following years, Hoechst invested large sums into its Guben site and relocated production processes in the field of polyester production from other sites in West Germany to Guben. This specialization process enhanced the establishment of a sustainable product niche. Since Hoechst itself was occupied with fundamental restructuring processes in the 1990s, however, the polyester production in Guben was outsourced to Hoechst Trevira and sold several times. After insolvency in 2009, the independent Trevira GmbH continued the production at Guben and was finally bought by the Thai investor Indorama Ventures in 2017. Currently, around 550 persons are employed at this plant (www.trevira.de/die-geschichte).

Two other companies can also be seen as CFG's successors. Megaflex is a family-owned enterprise that carried over from West Germany in 1991, with around 400 employees in 2019 (<https://www.megaflex-schaumstoffe.de/de/about>). ATT Polymers, a subsidiary of the Polish chemical giant Grupa Azoty in Tarnów, produces plastic granulate based on polyamide and employs around 60 persons. This means that there are still around 1000 people employed in the synthetic fiber industry in Guben today (Knoll 2022b, 233). Regarding R&D activities, however, at least the subsidiaries Trevira and ATT Polymers are typical examples of so-called extended workbenches focusing in production, whereas other important tasks like management or R&D are located at the company's headquarters.

In comparison to CFG, Stilon's path through the transformation period of the 1990s seemed to be rather even. Unlike in Germany, there was no political pressure for swift privatization. Because Poland entered the EU only in 2004, Polish companies like Stilon did not immediately become subject to fully fledged competition and EU legislation. Rather, Poland could protect domestic companies, which might have been impossible to

such a degree in eastern Germany. Starting in 1992, Stilon was financed by the state treasury in the form of a one-person company. In September 1995, 60 percent of Stilon's stocks were transferred to the National Investment Fund, 25 percent remained at the state treasury, and the remaining 15 percent were sold to the employees themselves. In 1998, the majority of shares were bought by the industrial group Rhodia and Nylstar, which had belonged to the French company Rhône Poulenc before it fused with Hoechst and became Aventis. In 2003, the company was divided into three parts. The production of synthetic fiber stayed at Stilon owned by Nylstar, whereas the production of granulate and monofilaments went to other companies belonging to Rhodia. The remaining units were specialized to find a niche in the competitive international market. In 2008, Stilon became part of the Polish group Martis, a producer of textile materials (www.martis-stilon.pl/firma), to which it belongs to this day, employing around 500 persons. Stilon's monofilament production was, in turn, taken over by the Swiss company Monosuisse, formerly belonging to Rhodia (<https://www.monosuisse.com/de/unternehmen/geschichte.html>). In April 2022, Monosuisse's production site in Gorzów employed around 175 people (<https://gorzowwielkopolski.naszemiasto.pl/w-monosuisse-stawiaja-na-jakosc-i-rozwoj-ta-firma-wciaz/ar/c3-8757227>).

The relatively slow privatization of Stilon, however, resulted in rather low investments at least in the first half of the 1990s (APG 37/2/1304, 287). As a consequence of the long stagnation period starting in the late 1970s, the production process was characterized by relatively high energy and labor costs as well as high consumption of raw and auxiliary materials, according to an internal analysis. Because Poland did not immediately enter into full-fledged competition with technologically more-advanced Western companies, Stilon was able to survive on the basis of its traditional polyamide production (APG 37/2/1304, 276–277). In order to gain access to the necessary amounts of capital for modernizing the factory, Stilon's marketing department recommended actively searching for foreign investors as well as active market cultivation to find new outlets for Stilon's products (APG 37/2/1304, 279). Stilon was able to close investment agreements with Western companies such as Barmag in 1994 to modernize its polyamide production to increase export possibilities (APG 37/2/1304, 287–288). Still today, Stilon does not possess its own production line for polyester fibers, but imports such fibers from abroad. In contrast to Trevira, however, Stilon has its own R&D unit.

4 RESULTS

This chapter sheds light on the following three questions. What kind of modernization barriers were encountered by the two plants? Are there significant differences between them? In which way did these conditions influence their development paths during the transformation period? Special attention has been given to four indicators: investments, technology levels, the workforce structure, and innovation output. These indicators are closely interconnected. Whereas overall investments give an idea of the political and economic importance of a company or branch, they are usually used to improve the technology level (intensive growth), especially after an initial construction period (extensive growth). An improving technology level has a direct, positive impact on innovation output, but only if a skilled workforce is in place.

This chapter identifies several modernization barriers. First, overambitious construction and production plans or their hasty implementation regularly resulted in significant setbacks, disproportions, and cost explosions, with tremendous adverse effects on the entire branch. Such overzealous implementation and kick-start problems are visible especially in the development of CFG. Second, despite massive investments in their early years, the machinery park in both plants became increasingly outdated starting in the late 1970s, resulting in gradual attrition of production assets. The shift away from the chemical branch toward new and more promising industries like microelectronics played a role especially in the case of CFG, whereas the overall economic crisis in Poland was decisive in the case of Stilon. Third, the rather low reliability of domestic and Eastern European suppliers and a general unavailability of state-of-the-art technology resulted in a growing dependency on Western technology, that is, the exact opposite of what was politically intended. This is true for both plants and over different time periods. Fourth, the increasing dependence on or entanglement with the West posed new challenges for the plants and higher-level institutions regarding the legal protection of economic interests and patenting endeavors. In both cases, these challenges could be met only partially. Finally, with regard to R&D, there are accounts from both plants that R&D staff were not employed according to their education level, indicating that meeting plan targets in production was more important than research.

These modernization barriers apply to both factories under study here. However, there are also significant differences. Regarding investments, at

CFG, a peak was reached in the second half of the 1960s, and at Stilon, roughly five years later in the first half of the 1970s. This is related to the general development of both plants, especially the fact that the chemicalization program in Poland was adopted only in 1973, that is, 15 years later than in East Germany. Due to the following economic crisis, its implementation failed. Whereas in the case of CFG the first decade can be called a hasty kick-start, the older plant Stilon underwent comparatively consistent development. Interestingly, this difference is also true for the 1990s. Regarding the technology level, CFG was meant to produce technologically demanding polyester fibers from the very beginning, but managed to do so only in the early 1970s through the adoption of Western technology. Stilon, however, has only ever produced polyamide fiber. Regarding the overall workforce, the numbers started to decrease at Stilon as early as the late 1970s, whereas the numbers at CFG stagnated throughout the 1980s. The R&D unit at Stilon seemed to be significantly smaller than that at CFG, but managed to survive in the 1990s. In turn, the remnants of CFG can be described as typical examples of extended workbenches without relevant R&D units. Regarding innovation output, a patenting peak was reached at Stilon in the late 1960s and early 1970s, whereas a peak at CFG was reached in the mid-1980s. With regard to the transformation process, the main difference between CFG and Stilon seems to be that, due to German unification, CFG became subject to restrictive EU legislation immediately, whereas Stilon received state financial support for several more years.

Despite these differences, the overall similarities between both plants predominate. Both were the targets of massive investments due to their importance as the largest synthetic fiber producers in East Germany and Poland. This resulted in similar developments in workforce numbers and the introduction of new technologies according to a similar sequence. Consequently, dependencies on Western technology supplies increased over the course of time. Both plants entered a period of stagnation in the 1980s.

These conditions heavily influenced the further development of both plants in the transformation period. Since both companies had already entered stagnation, with partly outdated production assets, neglected patenting, a rather small and inappropriately deployed R&D staff, and a steadily growing dependency on Western technologies, CFG and Stilon were ill-equipped for the upcoming transformation challenges. Furthermore, the cessation of former outlets in Eastern Europe

constituted a fundamental financial and structural challenge, and maintaining total self-sufficiency under new market conditions was unfeasible for both plants. Rather, a successful start in the transformation period seemed to depend on whether the company management acted proactively by seeking out potential investors in the West or implementing painful employment cuts. Such was the case with both factories and eventually resulted in survival and further development under the prevailing conditions. The remaining parts of CFG and Stilon thus had to accomplish “fast-track” specialization in order to find their product niches.

With the entire synthetic fiber branch in (Western) Europe entering a stage of reorganization in the 1990s due to considerable overcapacities, both companies saw repeated ownership changes for roughly another decade. Seen from this angle, it is rather surprising that both companies continue to exist today and are doing generally well, especially compared to other factories in their sectors and other sectors. On the basis of these two cases, however, it is impossible to draw a broader conclusion about the effectiveness of an abrupt versus gradual transformation. To be sure, both paths implied considerable financial transfers by state institutions with the aim of preserving as much of the former CFG and Stilon as possible.

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Inefficiency and Lack of Transparency in GDR Foreign Trade

Hans-Jürgen Wagener

I INTRODUCTION

Socialist planned economies are prone to autarky. International economic relations fit only with difficulty into a centralist administrative planning system. Its basic decision unit, the national state, has no possibility to directly control foreign economic agents. Insofar as potential trading partners also belong to a socialist planned economy, trade relations are initiated and executed through a cumbersome procedure of interstate arrangements. Insofar as those partners are autonomous within a liberal economic system, the socialist state will be subject to the risks and instabilities of the market and its numerous participants.

The political economy of socialism arises from socialization and internationalization as universal and secular trends. Historical development is focused on the socialization of labor in the context of the world market—that is, globalization. For capitalism, this tendency is evident according to

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Marx, and it is mediated by capital even if the capitalist system is crippled with contradictions. Under socialism, the trend should unfold without obstruction unless it is being prohibited by the prevailing system of state socialism: “Internationalization of the socialist economy does not proceed spontaneously, but like the process of socialization it needs the agency of the state” (Kohlmeier 1973, 124).

The transition to state socialism in Central and Eastern Europe was determined by the expansion of the Soviet empire in the wake of World War II. As the hegemonial power in the region, the Soviet Union succeeded in imposing its political and social system on its satellites. Soviet economic order targeted the industrialization of an underdeveloped, sprawling empire facing increasing isolation. This also affected the science of economics, where Marxist-Leninist political economy claimed exclusive validity.

In a country the size of the Soviet Union, foreign trade naturally plays a minor role. Confrontation with a hostile “imperialist” environment added to the isolation. Tsarist Russia exported chiefly agrarian products and imported manufactured goods. After 70 years of Soviet rule (and later), the structure of foreign trade had changed only insofar as agrarian products were substituted by industrial raw materials and fuel. For such a structure, comparative advantage is of little importance. Thus, the first textbook on political economy (Economics Institute 1957 [1954]), distributed with a print run in the millions throughout the region, contained among its 774 pages only two on foreign trade questions.

By setting up socialist peoples’ democracies and integrating them through the Council for Mutual Economic Assistance (CMEA) in 1949, the Soviet Union obtained partners with whom to take up foreign trade relations without being hampered by geopolitical and systemic confrontations. However, most of these countries were in a completely different social and economic situation for which the Soviet development model and strategy were arguably inappropriate. After all, these were small or medium-sized countries, some of which had developed industries and a corresponding high level of human capital (for instance, the German Democratic Republic, or GDR, and Czechoslovakia). Such countries are necessarily open economies: foreign trade is an important growth driver, and international competitiveness a precondition for innovation and prosperity, which the first German textbook on the political economy of socialism (*Politische Ökonomie* 1969, 456–68) made quite clear.

It is against this backdrop that the academic and policy treatment of East German foreign trade must be considered. It is characterized by a number of stylized facts or, in some cases, myths, whose proper analysis is hampered by socialist publication policy and its notorious secretiveness. Among those are:

- the foreign trade monopoly as the exclusive form of organization,
- the partitioning of international relations into intra-block trade and extra-block trade,
- the dominant position of the Soviet Union,
- intended autarky toward the West (*Störfreimachung*, or disengagement from obstructive relations),
- a low trade intensity,
- planned rationality, and
- disregard for modern foreign trade theory.

Through the remainder of this chapter, these topics will be briefly dealt with relying upon mainly East German scholarship, even if it is rather limited. During the reform period of the 1960s, problems of internationalization attracted theoretical attention. When Honecker took over from Ulbricht in 1971 and suppressed the reform which was basically Ulbricht's brainchild, interest in foreign trade waned and serious scientists (among others Kohlmeier, Grote, Otto, and Schulmeister) were given less chance to speak and to publish. The authoritative textbook (Faude et al. 1984) appeared rather late and remained theoretically weak despite its competent authors. In other socialist countries, foreign trade scholars were publishing in English and gained international recognition, for instance, Ausch (1972) from Hungary and Trzeciakowski (1978) from Poland. Among Western studies on socialist international trade worthy of mention are Kaser (1965), Boltho (1971), and Lavigne (1991), the latter of whose volume appeared in French in 1985. After the collapse of the GDR, Ahrens (2000) presented a thorough study of East German trade policy and the thorny subject of trade statistics.

2 GLOBALIZATION AS HIGHEST STAGE OF SOCIALISM

Like all socialist economic theories, the treatment of international economic relations is based on the classic writings of Marx, Engels, and Lenin. Marx was the first theoretician of globalization. Capital does not respect

borders, and the extension of the capitalist system and its markets is unlimited under competitive conditions, with the world market and the global economy as ultimate destination. The process of socialization takes place on an international level but according to capitalist rules (Kohlmey 1973, 92–3). Capital is the agent which, on the international level in particular, tends toward concentration and centralization.

The second half of the nineteenth century saw a fundamental change in capitalist development. After having sent their trade companies overseas, European national states engaged internationally and sought to partition the rest of the world among themselves: the age of colonialism and imperialism. Bukharin, Luxemburg, and Lenin incorporated this process into the corpus of Marxism through their theories of imperialism and state-monopoly capitalism. Next to capital, the imperialist state became the second agent. Universal socialization adopted the form of colonial exploitation and thus grounded later underdevelopment of the victims.

On the national level, progressing socialization under capitalism creates by way of concentration and centralization the preconditions of the transition to socialism. At the same time, the conditions for a socialist world economy will take root immediately after decolonization. Then, the basically positive effects of universal socialization can fully and cooperatively be utilized. This was Lenin's (1965 [1920]) perspective on historical development in 1920: "that there is a tendency towards the creation of a single world economy, regulated by the proletariat of all nations as an integral whole and according to a common plan. This tendency has already revealed itself quite clearly under capitalism and is bound to be further developed and consummated under socialism." Integrating the presently existing socialist countries is a first step in this direction. Such was the vision of Marxist-Leninists (Kohlmey 1973). The reality of state socialism told a different story.

3 THE FOREIGN TRADE MONOPOLY

The organization of international economic relations under state socialism was characterized by the foreign trade and foreign exchange monopoly of the state. As the leading textbook on economics (Kinze et al. 1989, 434) phrased the doctrine even as recently as 1989, "It is the concrete form of existence of the dictatorship of the proletariat in foreign trade." Immediately after the revolution, Lenin had declared it mandatory to

occupy this “important commanding height of the economy” (*Politische Ökonomie* 1969, 460). “The foreign trade monopoly embodies the sovereign right of the socialist state to govern and to plan the international exchange relations of the country in the interest of the whole society, to organize the implementation, and control it” (Faude et al. 1984, 49). Fritz Behrens, one of the very few critical and arguably one of the more capable East German economists, therefore dubbed really existing socialism “state-monopoly socialism” (Behrens 1992, 78; this book could be published only years after his death and after the end of the GDR).

The foreign trade monopoly had constitutional status in the GDR: “International economic relations including foreign trade and foreign exchange is a state monopoly” (*Verfassung der DDR* 1974, Art. 9.5). By contrast to state-monopoly capitalism, there is only one agent, the state. The economic units—firms and combines (*Kombinate*)—had no active role in international economic relations. To criticize the monopoly is revisionism. To leave planning and realization of actual foreign trade operations to the firms, as was occasionally ventured during the reform period of the 1960s, is concomitant to a “separation of state and economy in foreign trade” and intends only “to liquidate directive central planning and control of foreign trade relations” (*Politische Ökonomie* 1969, 463).

The organization of foreign trade under socialism proceeded according to a rather outdated model. To initiate and to handle import and export transactions by way of separate foreign trade firms was standard practice during the nineteenth and first half of the twentieth century. Independent wholesale and foreign trading companies operated as intermediaries between medium- and small-scale enterprises, with low export and import experience and their suppliers or customers abroad. They provided special services in information, contractual design, and logistics. Still today, wholesale and foreign trade companies play a dominant role in international commodity markets. However, product differentiation and specialization caused many manufacturing enterprises to manage marketing by themselves in order to avoid information losses and to optimize their supply chains and distribution channels. Concomitantly, high schools of commerce morphed into university faculties of business economics.

The rigid isolation of export producers from their foreign markets and the bureaucratic handling of transactions had turned out inefficient and inflexible. The New Economic System (NÖS), as the reform of 1963 was

called, was meant to remedy the situation (Grote 1964¹). Different options were discussed: liquidation of the foreign trade companies implying the abolition of the monopoly or full or partial export autonomy of individual firms (like Carl Zeiss Jena, which always had enjoyed a privileged position).² A more relaxed handling of the monopoly in export could be observed in Poland and Hungary. Decentralization seemed less compelling for import, since control and disposition of scarce foreign exchange remained a major central concern. It was proposed, however, that firms should have a greater say in decision-making.

The foreign trade monopoly allows for separating the internal from the external economy. “Under socialist conditions national and international circulation become more independent from each other than is the case under capitalism. Importing commodities by a capitalist and a socialist economy is of a qualitatively different nature” (Krüger 1984, 185). Even motivations for trade differ. The capitalist economy is demand-constrained, making export an important employment driver. The socialist economy is supply- or resource-constrained and engages in exports only to be able to import (Kornai 1979).

Under capitalism, enterprises, not the state, carry out foreign trade transactions. If we disregard tariff and nontariff trade barriers, there is open competition between domestic and foreign producers, which, at a given exchange rate, leads to approximation of market prices. Not so under socialism: “If due to their natural conditions socialist coal producers in the GDR produce above or below the cost at which the state buys coal in the international market, the socialist state will sell to coal consumers

¹This paper appeared two years later (Grote 1966) in a Western journal (*Economics of Planning*)—an exceptional event for GDR economics.

²Discussion took place mainly in the journal of the Ministry for Foreign Trade (and Intra-German Trade), *Der Außenhandel*. The journal was published in 1951–56 under this title, 1956–67 under the title *Der Außenhandel und der innerdeutsche Handel*, and since 1968 under the title *Sozialistische Außenwirtschaft*. A highlight of East German debate was an international conference at the Highschool of Economics in January 1968, which was extensively covered by the American journal *Soviet and Eastern European Foreign Trade* (Vol. 5, No. 1/2, 1969). Translations from *Sozialistische Außenwirtschaft* appeared in this journal between 1969 and 1972 alongside articles from the USSR, Poland, Czechoslovakia, Hungary, and Romania. While the latter continued to be published until the closure of the journal in 2002, East German contributions were discontinued after 1972. With Honecker’s accession to power, the GDR bid farewell to international scholarly debate. In 1973, *Sozialistische Außenwirtschaft* was shut down, which also muted the discussion on mathematical models and reforms of foreign trade planning that had been concentrated in this journal.

imported and internally produced coal at a uniform market price. For internal and external producers, the market value will be differentiated, however, according to natural conditions. Uniformity of market value will be suspended for producers" (Krüger 1984, 185). This holds true not only for raw materials, but the possibility of differentiation is generally given *mutatis mutandis* for exports as well. Exporting firms do not simply receive the equivalent of foreign exchange proceeds converted by the exchange rate. Between these proceeds and the internal remuneration is interposed a price equalization scheme. Internal export compensation is approximated to production cost, that is, the foreign exchange proceeds are irrelevant for the internal producer (Grote 1964, 1242). There cannot be a uniform exchange rate, but only product-specific coefficients (called enigmatically *Richtungskoeffizienten*, literally coefficient of direction, which says nothing about its character as differentiated exchange rate).

Economic implications of this practice are easily imagined: bureaucracy, inertia and distortion of information, inflexibility, disinterest among firms, weak customer ties on the one hand and unclear cost-benefit calculations on the other. What is profitable for the firm need not be so for the economy as a whole. Reform discussion within the NÖS had focused on management of the economy by economic levers, ultimately profit. To make this effective also for foreign trade, the price equalization scheme had to be abolished and the firms given freedom of decision-making and full responsibility for foreign trade transactions (*ibid.*, 1245-6), contingent on the establishment of a realistic price system and a uniform exchange rate.

The bulk of foreign trade was performed inside CMEA, with socialist partners having similar organization structures. Transactions had to be fixed in advance in bilateral five-year trade agreements, which could be specified in yearly protocols. The resulting international division of labor was determined less by profitability considerations than by the needs of the respective partner which, in the case of the GDR, was first of all the USSR. Trade with the non-socialist world (NSW) did not follow this rigid scheme and could also be used as flexibility reserve. Due to the notorious dearth of convertible ("hard") currencies and the effort not to become dependent upon the "imperialists" (*Störfreimachung*, disengagement from obstructive relations), no longer-term division of labor based on profitability could develop.

Kohlmeier's (1973) vision of an integrated socialist world market with full mobility of goods, services, factors of production, and information stood in sharp contrast to the rigidities caused by the centrally

administered economy with its foreign trade monopoly. Therefore, Kohlmeier (1968a, 97–100) pleaded for reform, a rational growth policy, and a rational economic mechanism on the national and international levels. By a rational growth policy, he understood a structural policy reducing the overstretched product range of medium and small socialist economies and strengthening specialization to obtain cost-saving batch sizes and economies of scale. This would also allow concentration and intensification of research and development.

In 1971, the Complex Program of CMEA had formulated similar objectives and recommended coordination of production programs. Despite some success (East German railway carriages, Czechoslovak trams, Hungarian buses, Bulgarian forklifts), this initiative came to a standstill. Even within the bloc, individual countries preferred a strategy of autarky, which also arose from the inability to determine rational specialization (comparative cost advantage).

As to the rational economic mechanism, “the number of extensive (often not free from contradictions and in kind) central directives to the firms should be reduced and replaced by a system where the central authority governs the subsystems mainly using monetary parameters and where the feedback from the firms to the center takes place via the market” (ibid., 98). Firms need more freedom of choice and decision-making. Internationally, this implies integration of production via integration of markets, which requires partial convertibility of currencies. “It follows that also in international economic transactions between socialist states monetary value terms should be decisive as reference variables. [...] Prices should not contradict quality, trade agreements in kind should not contradict the balance of payments, supply conditions should not contradict modern production technology, credit conditions should not contradict specialization and cooperation possibilities, etc.” (ibid., 99). Here, Kohlmeier has enumerated some of the actual problems. Put simply, realistic prices should guide production and international transactions.

In 1968, when Kohlmeier stipulated these requirements, the NÖS was already in its final throes. Politburo member Günter Mittag attacked his reform proposals fiercely in the 10th CC plenary session shortly after the invasion of Czechoslovakia put an end to the Prague Spring. Mittag (1968, 4) opposed “all forms of revisionism and dogmatism” (the party slogans for critical remarks) and stressed the importance of central plan directives and norms as tools to secure the power of the party. “Mastery of the economy for us is class struggle” (ibid.). Even the term “economic

mechanism” was tabooed in the textbook of 1969, which was meant to represent reform economics but, with Politburo member Mittag as chief editor, anticipated the reform skepticism of Honecker and the hardliners: “The economic system of socialism is not and never can be an economic mechanism in which the correct behavior of people will be induced quasi automatically by a system of economic levers. The attempt to construct such a mechanism would profoundly contradict the essence of socialist society” (*Politische Ökonomie* 1969, 212). This remark, of course, is targeted at the “New Economic Mechanism,” the Hungarian reform of 1968.

4 COMPARATIVE COST ADVANTAGE

Trade produces gains. This holds true for international as well as for inter-regional and interpersonal trade. Theory has to deal with two central problems: to determine the division of labor (i.e., in the case of foreign trade the export–import structure) and to determine the terms of trade (i.e., the relative prices of commodities). Solving these problems for international trade, scholars in the East and West took different paths.³ Both started, however, with David Ricardo’s (1951 [1817]) pathbreaking theorem of comparative cost advantage.

Two countries producing two goods with different productivities will benefit by entering into international exchange and exporting the goods for which productivity is higher and importing the goods for which productivity is lower, even if both productivities are higher in one country than in the other—the essence of comparative cost advantage. In the initial situation, the internal terms of trade (i.e., the commodity exchange rate) for the two goods are determined by labor cost (Ricardo assumed a labor theory of value). For instance, in country A, one pair of shoes exchanges for one goose, while in country B, one pair of shoes exchanges for two geese or, in other words, citizens of A have to give up one goose to obtain an additional pair of shoes, while citizens of B have to give up two geese. How many geese and pairs of shoes will be produced with the given factor endowment in both countries depends, among others, on demand. After lifting trade barriers, citizens of B will buy shoes in A, giving up fewer than two geese for one pair, and citizens of A will buy geese in B, giving up less

³It should be noted, however, that Soviet scholars, such as Nobel Prize winner Leonid Kantorovich (1965), engaging with general equilibrium theory (optimal planning), arrived at results similar to those of their Western counterparts.

than one pair of shoes for one goose. In the end, the two countries with their given factor (labor) endowments can produce and consume more shoes and/or more geese than in the initial situation. In the final situation, the terms of trade of the two goods will evidently be in the range between the two initial values (Kohlmeier 1968b, 78). The exact value can be calculated only by taking the relative size of the two countries (or their factor endowments) and total demand into consideration.

An international central planner controlling both regions (countries) would, under Ricardo's assumptions (immobile factors of production, linear production functions), reduce or stop production at the relatively inefficient location (geese in A, shoes in B) and have demand met with a gain at the relatively more productive location. Such a superior planning authority did not exist under state socialism. Khrushchev's attempt to establish it inside CMEA failed. But it remained on the agenda as a long-term objective (Faude et al. 1984, 93). In market economies, the decisions are mediated via the market price, and where this market is absent, that is, in state socialism, intergovernmental negotiations of the foreign trade monopolies have to fix the division of labor and the terms of trade.

Ricardo did not solve the problem of the terms of trade. He only stated that after specialization, the rate of exchange of the two goods must deviate from relative labor expenditures in the two countries. Marxists considered this a gross mistake, since for them the law of value (goods exchange in relation to labor expenditures that are socially necessary on average⁴), and hence the labor theory of value, is generally valid. According to doctrine, both problems, the division of labor and the determination of the terms of trade, can be solved solely by production cost or labor values. International value is a weighted average of labor expenditures in the individual countries (Gündel 1968, 62). Hans-Peter Krüger (1984, 73–6) saw that this is evidently impossible to establish in the two-country-two-goods case since there cannot be an average labor value if each country produces only one good. Such was Ricardo's assertion.

The presentation of the Ricardian theorem in the textbook of Faude et al. (1984, 166–8) runs into difficulties here. The authors simply postulate an international value deviating from the national labor values. By adding a third country or more (Krüger's solution), at least an average can be calculated, but cannot suspend the contradiction, for which demand and the relative size of the two countries are needed. Neither the textbook nor Kohlmeier (1968b) and Krüger (1984) can present a consistent theory

⁴ Socially necessary is marginal rather than average cost. But that is a side issue here.

of the terms of trade. Therefore, they are also unable to explain the distribution of gains from trade. Alternative theories of specialization and comparative advantage, like Heckscher-Ohlin or intra-industry trade (Boltho 2023), have not been reflected in the GDR.

An additional problem afflicted not only trade policy in the Soviet Union and the GDR, but also Marxist development theorists. A highly productive country produces a commodity with lower labor expenditures and, hence, with a lower labor value than a less productive country. If the commodity is realized at a uniform international value, gains and losses arise. It looks as if the productive country appropriates labor value from the less productive: unequal exchange. This argument turned up in economic relations between the rich industrial and the poor developing countries. It was proof of imperialist exploitation. “The theorem of comparative advantages as major element of bourgeois foreign trade theory is meant to contribute to obscure the exploitative relations in the capitalist world economy and to eternalize the economic backwardness of less developed countries together with their dependence upon the major imperialist powers” (Faude et al. 1984, 171).⁵ Irrespective of the iniquities of imperialism, the argument is a fallacy. The theorem does not compare the (high) labor content of exports of developing countries with the (low) labor content of their imports; rather, it compares the cost of imports with the alternative cost of import substitution (called in the GDR *Antiimportproduktion*) in the own country. Marx (1959 [1894], 168) had already observed this: “The same may obtain in relation to the country, to which commodities are exported and to that from which commodities are imported; namely, the latter may offer more materialised labour *in kind* than it receives, and yet thereby receive commodities cheaper than it could produce them.”

Such considerations had a certain relevance for trade between the USSR and the GDR. In the Soviet Union, people argued that the exchange of raw materials against manufactures—the bulk of trade between the two countries—did not take place on the basis of equivalence. The Soviets expended more labor (development and transport costs) than was remunerated in the price which was fixed on international markets and not by internal cost of production (Kohlmeier 1968b, 95–7; Krüger 1984, 184–96).

⁵The authors overlook the fact that international trade takes place predominantly between developed countries and largely as intra-industry trade. Driving forces are product differentiation, specialization, research and development, and positive economies of scale on the supply side and increasingly differentiated preferences on the demand side. These factors do not contradict comparative advantage but dynamize it.

The argument may have had some substance, but the fact seems to have been a deliberate Soviet policy of implicit subsidization. The GDR, like other members of CMEA, benefited from advantageous terms of trade. This hypothesis had been put forward most rigorously by Marrese and Vaňous (1983). The GDR imported Soviet raw materials and fuel at lower than world market prices and exported manufactures at higher than world market prices. The hypothesis had triggered a broad discussion in the West but was confirmed by almost all East European experts after the demise of the system (Stone 1996). Such measures for the stabilization of the Soviet empire became an intolerable burden for the Soviet Union in the course of time and were discontinued by Gorbachev.

Under capitalism, independent enterprises decide on import and export. Comparative cost advantage will assert itself via the working of the market. Under state socialism, the central authority has to plan and implement the most favorable trade flows by way of some kind of optimization calculus. This implies explicit knowledge of comparative advantage. Within CMEA, two foreign trade monopolies are negotiating with each other—a bilateral monopoly whose equilibrium is not determined. This is not discussed in East German literature, but the fact is reflected indirectly: “The CMEA price system represents the level of prices, the price relations, and the principles and methods for the setting and changing of contract prices. CMEA contract prices are those agreed upon in trade negotiations between CMEA partners and will be used to value and settle the exchange of goods and services” (Faude et al. 1984, 112).

The complexities of the situation can be analyzed using mathematical economic models. In the reform years of the 1960s, East German as well as Polish and Hungarian scholars worked intensively on such models (e.g., Grote et al. 1970). They formulated profitability criteria, which can play an important role in foreign trade planning (Faude et al. 1984, 175–8; see also Boltho 1971). Examples are:

- Export rentability = export proceeds (in domestic currency) / domestic expenditure for the export goods
- Import rentability = domestic proceeds of the imported goods (import delivery price) / foreign exchange expenditure converted into domestic currency.⁶

⁶Comparative advantage would suggest “expenditure for the imported good / cost of import substitution” as indicator.

The export rentability is the basic indicator by which to judge the efficiency of trade: “According to planning regulations it is to be applied as mandatory plan indicator to kombinats and firms differentiated for economic areas [sc. socialist or non-socialist]” (Dietrich et al. 1986, 42). Such indicators are meaningful only if prices are objectively given and there is a uniform exchange rate. The former is the case with competitive market prices. Theoretically, optimal plan prices or “objectively determined valuations,” as Kantorovich (1965 [1959]) had dubbed them, could be used as well. Similarly, the uniform exchange rate is either fixed in the free foreign exchange market or bilaterally by purchasing power parities. A price equalization scheme with product-specific exchange rates (*Richtungskoeffizienten*) makes the assessment of comparative advantage impossible. In this case, export rentability converges to 1 for all goods, as Faude et al. (1984, 177) tersely remark. Similarly, import delivery prices fixed by the planner obliterate rentability indicators.

5 PRICE FORMATION IN INTERNATIONAL TRADE

Actual price formation in international trade by socialist countries appears slightly schizophrenic. The socialists want to distance themselves from capitalist markets: “It should be beyond question that the socialist economic integration has led to the emergence of a specific structure of socialist international values” (Ambrée et al. 1977, 266). So, there are socialist and capitalist world market prices. At the same time, prices in CMEA trade are oriented toward the prices in the major commodity markets, and those are predominantly capitalist markets. For bulk goods, such prices are easily ascertained since the markets are organized commodity exchanges. For manufactures, a “valuta price effort” is needed “with the help of documents (bills, price offers, catalogue prices, pricelists, price information, exchange quotations, auction prices, price indices)” (Faude et al. 1984, 194–7). Armed with such data, the negotiators entered into bilateral trade talks and worked to reach agreement on quantities and prices in the accounting unit of the transferable rubel. Trade with the NSW was handled in convertible currency, and prices were more directly determined by world market conditions. Production firms do not show up in this picture. They “traded” with their national trade monopoly companies, which had to look after profitability. Due to internal pricing policy and the exchange rate, the mentioned rentability indicators must have served as poor guidance.

Within CMEA, two commodity groups emerged: “hard” goods and “soft” goods. The former could also be sold in the West for convertible or “hard” currency. Soviet raw materials and fuel counted among the “hard” goods. “Soft” goods were less competitive because of quality, poor innovation, and specialization. In market economies, there are more or less competitive goods, too, but no hard or soft goods. This is a question of price. Differentiation within CMEA reflects an excessive price level for “soft” goods compared to the world market. Countries therefore sought to trade them only for “soft” goods and preferred hard currency for “hard” goods. We have nevertheless seen above that there may have been a systematic bias or implicit subsidization in Soviet–CMEA trade.

Bilateralism and categorization of goods limit the size of trade turnover. CMEA was meant to establish an international currency system, with the transferable rubel (TR) as accounting unit. The intention to surmount the restraints through multilateral clearing and an international credit system following the model of the European Payments Union (1950–58) led only to modest results (Clement 1990). The actual exchange rates to the TR within CMEA were fixed on the basis of purchasing power parities of a range of export goods at industry prices. Major changes in the parities allowed for adjustments of the exchange rates (Dietrich et al. 1986).

Foreign trade statistics of the GDR were calculated and published in “*Valutamark*” (VM), a fictitious unit of account with no other function. Internally relevant was the “*Valutagegenwert*” (VGW) or foreign exchange equivalent in marks of the GDR (M). It testifies to the notorious secrecy around foreign trade that the concepts of VM and VGW are nowhere unambiguously defined. The textbook of Faude et al. (1984), for instance, has no such item in its subject index.

Trade within CMEA was handled in TR. For internal use, the foreign exchange values were converted with the exchange rate into VGW. The foreign trade statistics, however, reported the CMEA trade in VM. This is reflected in the economic dictionary *Ökonomisches Lexikon* (1980, 403) explaining VGW as “exchange equivalent expressed in VM,” which can be valid only for CMEA trade. By implication, this trade entered the statistics at the effective VGW or mark value. For the producing firms, it was irrelevant, since, as we saw, they “traded” with the foreign trade monopoly companies using, naturally, the mark of the GDR. But since the exchange rate to the TR was based on purchasing power parity, the price level of export and import goods in VM probably did not deviate significantly

from the internal price level in M or from factor cost (see also Ahrens 2000, 62).

This was definitely not the case with NSW trade. The statistical practice, however, remained murky. Only the last statistical yearbook (*Statistisches Jahrbuch 1990*) provided some clarification. As the monography *Valutaökonomie* (Dietrich et al. 1986, 23) clumsily phrased it: “Towards the non-socialist world the *Valutamark* (VM) is used in the context of the conversion of value terms of foreign currency into the currency of the GDR. The *Valutamark* is a planning and accounting value for exports and imports.” It is based on the fiction “*Mark ist Mark*” (mark of the GDR is equal to DM). Hence, trade with the FRG entered foreign trade statistics at the exchange rate of 1 DM = 1 VM.⁷ The exchange rate of other non-socialist currencies was oriented to the \$-TR rate, in itself not a market exchange rate, and from there converted into VM (Volze 1999). The upshot of this practice is a “split” *Valutamark*, as Volze (1999) has called it. The VM in CMEA trade and VM in NSW trade were two (or more) different units: the data of both areas cannot be added to a uniform aggregate even if this was the practice for foreign trade statistics.

Clearly, an East German firm receiving proceeds from exports to the NSW in VGW or mark of the GDR at those rates would get deeply into the red. Factor cost was markedly higher. This was corrected by the specific *Richtungskoeffizient* or actual exchange rate. In fact, exporting firms received prices covering their costs independent of the revenue in foreign exchange. Export decisions were governed by other considerations than profitability.

An illustrative example is the reflex camera Practica. It could be sold on the Western market at a price of about 200 DM, well below the technologically more advanced Japanese competitors. Production cost amounted to about 900 M, and the camera was sold for this price on the internal market (*Statistisches Jahrbuch 1990*, 311). The producing firm Pentacon in Dresden was credited the VGW consisting of the foreign exchange receipts multiplied by the product-specific *Richtungskoeffizient*. For the firm, the export was profitable. Not so for the GDR economy. This became blatantly obvious when in July 1990 the two German states entered a currency union, with the DM as currency. Wages were transposed on a one-to-one basis, that is, production costs of 900 M amounted now to 900

⁷In fact, trade with the FRG was done in *Verechnungseinheit* (VE), which was equivalent to VM.

DM, while prices (in the West and, hence, in the unified market) remained unchanged. The firm had to be closed immediately (Böick 2018, 300). This was not an isolated incident.

6 SOME STATISTICS

In trying to ascertain foreign trade intensity and foreign trade structure of the GDR, one has to take into account that comparability within CMEA as well as with market economies is thwarted by grave shortcomings. The main reasons are planned and bilaterally agreed prices that did not necessarily reflect scarcity, and that the exchange rates used for statistical purposes were incoherent and unclear, as stated, and so was the conversion of Transferrubel and valuta prices into mark of the GDR.

Industrial countries of the size of the GDR are normally open economies with a high foreign trade intensity. This seems not to have been the case, confirming the widespread hypothesis that socialist economies tend to be autarkic. The authoritative textbook of Faude et al. (1984, 26) indicated the share of exports in national income for the end of the 1970s at 30 percent. This was based not on own national statistics, but on a Soviet source.⁸ Considering that the national income according to the socialist Material Product System is lower than GDP according to the Western System of National Accounts, the indicated intensity in relation to GDP could be estimated at about 23 percent, which would indeed be a rather low figure. And it must have been considerably lower in the preceding decades since East German foreign trade had grown rapidly since 1970.

To relate VM (export and import) with M (national income) does not make sense due to dimensional differences, but up to 1990, this was all East German statistics offered. Only the *Statistisches Jahrbuch 1990* published data on GDP and foreign trade in VGW/M. As expected, the absolute and the structural figures changed markedly, which can be read from the data for 1985, the year for which they are given in both units (see also Ahrens 2000, 56–60).

Udo Ludwig and Reiner Stäglin (1999, 571) reconstructed independently East German national accounts and calculated export and import

⁸The Soviet source had evidently related GDR exports in VM to national income in mark of the GDR. This relation was exactly 30 percent in 1980 (see Table 6.1).

quotas. Their data for 1985 correspond fairly well with those of Table 6.1.⁹ Foreign trade turnover (i.e., export plus import) quota between 80 and 90 percent of GDP is high for a medium-sized country by international standards, whatever our reservations as to the comparability of East German statistics. Autarky had not been a policy option in the Honecker era. This does not imply, however, that foreign trade was particularly efficient. On the contrary, the high export figures in VGW or mark of the GDR were due to ever-increasing expenditures for export goods in internal currency and a parallel increase of planned internal prices of import goods. This is reflected by the deteriorating exchange rate or growing *Richtungskoeffizient*, which was 2.0 on average in 1970 and 4.40 in 1989. The driving force behind the export efforts was the increasing need of imports, supplies and technology for industry, and consumer goods for the population. Financing imports through external debt was a strategy during the 1970s, but it was not sustainable and became a curse in the 1980s. Export receipts had to be generated at any cost. We arrive at a rather paradoxical conclusion: “Foreign trade quota gets higher the lower the Mark of the GDR is valued in relation to other currencies” (Ahrens 2000, 59).

Table 6.1 Export and import of the GDR 1980–89, in billions

	<i>Export</i>				<i>Import</i>			
	VM		VGW		VM		VGW	
	1980	1985	1985	1989	1980	1985	1985	1989
Total	57.13	93.49	148.23	141.10	52.97	86.70	128.29	144.71
In percent of GDP	23.33	29.98	47.55	39.93	25.7	27.81	41.2	41.0
In percent of NI	30.3	38.65			33.4	35.84		

Source: *Stat. Jahrbuch 1990*, 107, 278; own calculations.

⁹See also Ludwig et al. (1996) for a reconstructed I-O table for 1987. It attempts to reevaluate the GDR I-O table in D-Mark and compares the results. The most striking difference occurs in foreign trade. While the share of exports in GDP in Mark of the GDR was 47.3 and of imports 48.3 per cent, these shares dropped to 27.2 and 25.1 per cent in D-Mark (ibid., 45). This may be explained by internal overpricing of foreign trade to match the low domestic productivity and to the chosen exchange rates.

The switch from VM to VGW/M in foreign trade statistics had a remarkable impact on the structure of trade. Internal expenditures (in M) for trade with the socialist world (SW) corresponded, as shown, more to receipts and expenditures in VM than for NSW trade. The structural break in 1985 may reflect an increase in GDR trade, but for the greater part it is due to the recalculation from VM to VGW.

Table 6.2 shows:

- GDR trade grew rapidly between 1970 and 1985.
- Revaluation in internal currency affected SW trade much less than NSW trade.
- While SW trade amounted to roughly two-thirds measured in VM and was so reported in publications and the press, it dropped below 50 percent measured in VGW.
- The drop was less marked for imports from the USSR, which can be ascribed to volatile oil market prices.
- Trade with the NSW, in particular with West Germany, was heavily undervalued in VM compared to internal cost.

While revaluation changed absolute figures roughly by 10 percent for SW trade, they more than doubled for NSW trade and more than quadrupled for trade with West Germany (see Table 6.3). Figures for Austria, Switzerland-Liechtenstein, the Netherlands, and the UK, available only for turnover (exports + imports), are added. With these countries, the GDR had sizable trade relations. This reveals great differences of treatment, which cannot be explained by any consistent exchange rate pattern.¹⁰

Why was so-called inner German trade so grossly undervalued by GDR statistics? Of course, East German literature makes no mention of the fact.

¹⁰Since the internal exchange rates (*Richtungskoeffizient*) were product-specific, the commodity structure of trade may have had some influence. Table 6.3 contradicts the description and data given in Gerhard Heske (2005, 139–40). According to Heske, a former staff member of the GDR statistical office, free currencies were first converted into DM and then noted in VM. (According to Volze (1999), this conversion was done via the TR and its exchange rates to Western currencies.) Conversion from VM into VGW/M need not be uniform for all currencies because of the average character of the *Richtungskoeffizient*. According to Heske, however, it was uniform for most of the years indicated. For the year 1985, which is the reference year of Table 6.3, Heske gives a uniform rate of 2.60 for the DM and other free currencies. For the latter, it can be correct on average. It certainly is not for DM, as Table 6.3 shows.

Table 6.2 Foreign trade structure

	Exports							
	SW				NSW			
	Total		USSR		Total		FRG	
	In billion	In percent	In billion	In percent	In billion	In percent	In billion	In percent
1970 (VM)	14.22	73.9	7.31	38.0	5.02	26.1		
1980 (VM)	39.72	69.6	20.40	35.7	17.41	30.5		
1985 (VM)	60.81	65.0			32.68	35.0		
1985 (VGW)	64.40	43.4	36.89	24.9	83.83	56.6	28.4	19.2
1989 (VGW)	65.29	46.3	33.54	23.8	75.81	53.7	30.2	21.4
	Imports							
1970 (VM)	14.12	69.4	8.17	40.1	6.24	30.6		
1980 (VM)	40.09	63.7	22.21	35.3	22.88	36.3		
1985 (VM)	58.23	67.2			28.47	32.8		
1985 (VGW)	67.02	52.2	41.54	32.4	61.27	47.8	26.8	20.1
1989 (VGW)	61.93	42.8	31.90	22.0	82.78	57.2	26.6	18.4
	Turnover							
1970 (VM)			15.48	39.1			3.4	8.7
1980 (VM)			42.61	40.5			7.3	6.1
1985 (VM)			69.94	38.8			11.4	6.3
1985 (VGW)			78.43	28.4			55.2	20.0

Sources: *Stat. Jahrbuch 1989*, 241–2; *Stat. Jahrbuch 1990*, 277–8; own calculations.

Table 6.3 Relation VGW /VM in1985

Total exports	1.59
Total imports	1.48
Exports SW	1.06
Imports SW	1.15
Exports NSW	2.57
Imports NSW	2.15
Turnover USSR	1.12
Turnover FRG	4.83
Turnover Austria	1.58
Turnover Switz.-Liecht.	2.06
Turnover UK	2.72
Turnover Netherlands	2.29

Sources: Stat. Jahrbuch (1988, 241–2), Stat. Jahrbuch (1990, 277–8); own calculations

Volze (1999, 240) hints at Soviet mistrust regarding excessively close relationships between the two German states, which was brought home to Honecker by Brezhnev in 1970 (Notiz 1970). Trade with the FRG was not to appear as exceeding 10 percent of the total, which it never did statistically. The Soviets seemed to have swallowed this fake, which, in a way, is confirmed by Stone (1996, 5): “Soviet bureaucracy consistently allowed itself to be manipulated and outmaneuvered by the East-Europeans.”

Foreign trade and foreign exchange monopoly “make it possible on principle to control foreign exchange receipts and expenditures in such a way that the concerns of proportionality and stability of the economy are met” (Faude et al. 1984, 39). This would require a sound balance of payments. Balance of payments theory is not a *forte* in the quoted textbook. Neither is it in the published statistics. One reason may have been secrecy: the balance of foreign exchange was among the best guarded information since it would enable evaluation of GDR creditworthiness. A second reason was the practical impossibility to aggregate trade turnover measured in different units in a uniform balance. The balance of payments was therefore divided into SW trade and NSW trade, but never consistently published. Correspondingly, there were two top secret balances of foreign exchange, in TR and in convertible currencies. *Post festum*, the German Central Bank made the heroic attempt to aggregate the two partial balances of SW trade and NSW trade for the period 1975–89 (Deutsche Bundesbank 1999).

It failed ultimately. The first task was met satisfactorily, namely, to rearrange the data conforming to the customary balance of payments methodology. The second task required revaluation of the individual balances in order to get uniform data. This revaluation was not done in VGW or mark of the GDR, but remained in VM. NSW VM were close to foreign exchange in convertible currency (“*Mark ist Mark*”). This partial balance could thus be said to be comparable to convertible currency. If only it were possible to convert SW VM into the same unit, the problem seemed to be solved. However, we have seen that SW VM were in fact VGW or mark of the GDR, obtained by the TR–M exchange rate of 4.67:1. Deflating this exchange rate does not transform SW VM into NSW VM.

The Bundesbank simply halved the exchange rate of the TR and kept it constant for the whole period 1975–89. No reason for this operation is given. Of course, the share of SW trade was thus reduced, but the obtained figures in VM had nothing in common with NSW VM. Revaluing NSW trade in VGW/M could have led to a uniform balance of payments. But the link to the foreign exchange balance would have been lost, and in any case there are two such balances needed—one in TR and one in convertible currency (DM or US\$)—as there are also two foreign debt accounts. The information of the *Statistisches Jahrbuch 1990* (see Tables 6.1 and 6.2) was disregarded, and only would have allowed setting up a balance of payments for the period 1985–89.

7 CONCLUSIONS

The East German stance toward foreign trade was ambivalent. Traditional inter-firm relations from the prewar period with West Germany were advantageous. Both sides did not treat them as ordinary foreign trade, even after the foundation of the European Economic Community, and the GDR benefited from a fixed West German credit line. At the same time, this inner-German trade was regarded with suspicion from the Soviet side, and East German policy was weary of becoming vulnerable to sanctions and sought to reduce strategic links (*Störfreimachung*). Yet in the end, West Germany was again, next to the Soviet Union, the most important trade partner.

Ascertaining total size, growth, and regional structure of East German foreign trade is made difficult by valuation idiosyncrasies, secretiveness, and propaganda efforts. Only the *Statistical Yearbook 1990* aimed to give exact information, “while in the past the influence of agitation could not

be overlooked,” as the long-time head of the Statistical Office Arno Donda remarked in the preface to the last yearbook (*Statistisches Jahrbuch 1990*, III). A planned economy without exact statistical information cannot function properly. Even if scientists and planners used better statistics, classified and hence unpublishable, information lacunae were a notorious shortcoming of the planning process and must have led to policy and planning errors.

With respect to foreign trade, it seemed hardly possible to determine a profitable specialization strategy and derive from it an efficient import and export structure. The GDR, like most socialist planned economies, produced and also exported a broad production portfolio in relatively small batches. At the same time, product differentiation was not elaborate. National as well as international division of labor was not very deep due to planning requirements and the neglect of small and medium-sized enterprises. As a consequence of these characteristics, research and development was slow despite adequate engineering capacities. The pressure of international competition was not felt directly by the firms, since they traded only with domestic foreign trade companies and got their factor costs covered independent of the revenue at the border if their products were selected as export goods by the planner.

As the most productive economy within CMEA, East German manufacturing had a prominent position, while on the capitalist international market its competitiveness increasingly lagged behind. The GDR neglected its traditional comparative advantage. The example of car manufacturing is telling. In the prewar period, two important car manufacturing centers were located in East Germany: Zwickau in Saxony and Eisenach in Thuringia. After the war, the factories were dismantled by the Soviets, and the enterprises closed or nationalized. Some firms and part of the qualified labor force moved to the West. This lasted until the mid-1950s, when car manufacture was taken up again at these locations. They produced simple and solid cars for decennia without innovative changes in technology and design. There was no specializing cooperation with other CMEA countries, let alone with the West. When in 1990, West German enterprises returned to the traditional sites, they set up new factories next to the worn-out old ones. The valuable asset of the locations was labor force. At the same time, West German enterprises engaged in foreign direct investment in the countries of Eastern Central Europe to exploit comparative advantage. The GDR had missed its chances to reestablish a highly renowned traditional industry which, after its relocation to West Germany

(Audi, for instance), became a prime driver of postwar West German export success.

The intensified East German foreign trade activity starting in the early 1970s stands in stark contrast to the simultaneously fading interest in scholarly analysis and modeling of international relations or the economy in general (Wagener et al. 2021). Not only had the reform of 1963 come to a halt, but also critical voices from academia about planning practice were muted. The shock of the Prague Spring made itself felt. Economic decision-making was governed again by Soviet precedents and ad hoc considerations. Strategic long-term planning, which had been central in the original reform ideas and which was crucial for efficient foreign trade activity, did not get off the ground. As we saw, sound efficiency or profitability criteria on which to base foreign trade decisions were also a major shortcoming. Instruments proposed by theory could not be implemented empirically because of unsound statistical information and because of ideological reservations. The needs of the day governed decision-making. A special foreign trade complex, the so-called *Kommerzielle Koordination* (Ko-Ko), was successful in generating convertible foreign exchange. But this could only be achieved by operating outside the ordinary planning system (and in the margin of legality).

The inefficiency of GDR foreign trade with capitalist economies is manifested in the dramatic decline of the effective internal exchange rate (the average *Richtungskoeffizient*). Such huge devaluations normally can be ascribed to large differences in inflation. It is hardly conceivable that the purchasing power of the mark of the GDR (for industrial products, not for consumer goods) fell in the relevant period so much faster than the DM, despite all affirmations of price stability. However, by inflation, one has to understand not only price and cost increases but also quality deficiencies, lacking product and assortment innovation, and commercial deficits. In addition, the need to generate hard currency at any cost in order to meet pressing credit obligations and import demands haunted the planners. In 1989, annual credit obligations amounted to 150 percent of the export receipts in hard currency as reported to the Central Committee by the head of the Planning Office together with the Minister of Finance, the head of the Statistical Office, and the head of Ko-Ko (Schürer et al. 1996 [1989]). The foreign debt problem remained with less than 60 percent of GDP in M (ibid., 454) even within the limits of Maastricht. Still, it was considered alarming because of the time structure of credit obligations, and so it became indicative of East German modernizing and efficiency deficits, which manifested themselves patently in foreign trade.

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The Communist New Man Versus the Bourgeois Individual: Family Enterprise in Poland and East Germany

Sławomir Kamosiński

A family company is like heritage – one must not reject it, nor sell it.
A. Blikle

I INTRODUCTION

When the Polish People's Republic (PPR) and the German Democratic Republic (GDR) fell under Soviet hegemony and departed from the democratic institutional order, the communist authorities saw it essential to shape a new man. He was expected to be aware of class affiliation and thus be detached from the tradition, customs, and culture that had shaped him since youth, leading to a collision between formal and informal institutions. Informal institutions create principles of social conduct. They are cultural norms created by shared religious rules, systems of values, customs, and symbolic gestures (Gruszevska 2012, 63–64). Informal

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institutions evolve very slowly under the influence of historical factors. Informal institutions are the pillars on which the formal ones are established: the legal regulations and political institutions that create strategies for socio-economic development. These formal institutions are subject to rapid changes in time.

The new communist man was outright opposed to the liberal, 'bourgeois' individual populating the non-socialized sector of the centrally planned economy, in particular the family firms, which were subject to severe limitations. The institution of socialized ('nationalized') ownership was given absolute priority. The stability of legal rights to own and freely use property is of key importance for the everyday operation of small family businesses. Sometimes referred to as 'business marathon runners', family firms are organizations of long duration. They draw on past experience and form their individual ritual of cooperation with those around them, based on tradition, ethics, and the so-called 'principles of the founder'. In a free market economy, these organizations display a high level of resilience in crisis situations. A characteristic feature is their will to survive. In the socialist economy, which was plagued by a permanent crisis of shortages, private businesses, including family ones, made up some of the shortages of products on the market.

This chapter explains the institutional regulations that allowed the foundation and operation of family businesses, in an economic system that was based mainly on nationalized ownership of the means of production accompanied by central planning and administratively determined prices.

Research on the economic systems of the PPR and the GDR has focused mainly on the overall image of their economies (Kaliński 1995; Bałtowski 2009; Burant 1988). The course of nationalization of enterprises in the PPR and in the GDR was already described in the socialist period (Falk 1976; Jędruszczak 1967). The tradition of entrepreneurship and of the social and cultural capital of entrepreneurs has attracted the attention of several historians, sociologists, and economists (Kühn et al. 2020; Ochowski 2013; Trecker 2022; Pickel 1992). Genetic entrepreneurship has been researched by Bernat (2022). A considerable contribution to the analysis of the traditions of entrepreneurship is made by the memoirs and diaries of entrepreneurs (Zasiadczk and Krasicki 2016; Prywaciarczyk 2001). To understand the modernizing role of entrepreneurs, it is essential to study the regional asymmetry of innovativeness (Fritsch et al. 2022; Fritsch et al. 2021a; Fritsch et al. 2021b). Flade and Kamosiński (2021) compare the sizes of the non-socialized sectors in the PPR and the GDR.

Research on the phenomenon of family businesses aims to elucidate their role in the economy and to examine problems related to succession (May and Lewandowska 2019; Lewandowska and Tylczyński 2014; Sułkowski 2004). Within the scope of this research, attention is drawn to the tradition of family firms seen from the perspective of the founder's mentality (Zook and Allen 2017; Lewandowska 2020). There appear to be no studies explaining the impact of formal institutions, mainly legal regulations, on the functioning of family businesses in East Germany and the Polish People's Republic. It should be noted that the communist authorities treated the law as an instrument to destroy these economic organizations. This was a consequence of the influence of the Marxist–Leninist ideology on the provisions of the law. There is a lack of studies on the problems of founding and operating family firms in the PPR and the GDR, in particular the legal conditions regulating their operation. There exist some comparative studies of Polish and East German constitutional law, as well as the law on property rights and inheritance (Bużowicz 2016; Grzybowska 2011; Machnikowska 2010; Malicka 2021; Waligórski 1988). However, there is still a gap in research in relation to the legal conditions that effectively hampered succession in family firms or favored what was called silent succession, performed with the tacit permission of the authorities.

When attempting to develop this broad research field, one must pay attention to the constant presence of informal institutions in tradition and social mentality (including the internal culture of organizations, their identity, and brand image). Probably due to the fact that family businesses often escaped the formal control of the communist authorities, they were considered dangerous to the system—apart from the fact that they did not conform to the Marxist–Leninist ideology. Two concepts related to property require clarification: personal property and individual property. In East Germany and in the Polish People's Republic it was recognized that personal property might consist of a car, furniture, and books. Individual ownership applied to real estate, including workshops and means of production. Discussions concerning the right to dispose of these forms of property during life and after death were part of the reality of the GDR and PPR.

This chapter will focus on the aforementioned issues. The fragmentary character of the chapter means that it will leave many problems unanswered but will raise questions for further analysis.

2 INHERITANCE LAW AS A PILLAR FOR ESTABLISHING FAMILY BUSINESSES

When we speak of a family business or family company, we assume that it is at least 51% owned by the family. Another criterion in the definition of a family business relates to management: in such an organization it is the family that takes both major and everyday decisions. The third element in the definition of a family business is succession—the intention to preserve the continuity of the enterprise within the family. Peter May and Adrianna Lewandowska consider a family company to have three basic features: dominant ownership, family, a will to preserve the business through the generations (May and Lewandowska 2019, 34–37). If communist rulers wanted to get rid of this contradictory element in their system, they would attack all three basic features by means of legal regulations. Restrictions on the ownership of means of production and breaking of the continuity of family enterprise played a dominant role.

In the process of succession of a firm, apart from material goods, intangible values are also passed down, such as the culture of conducting business and the firm's past, perceived as its identity. The process of succession or inheritance is thus perceived in terms of material, social, and cultural capital, which makes it possible to connect the firm's past with its future in the present day. For this reason, the act of a firm's succession or inheritance destroyed the communist authorities' concept of a new man: the man who was to be released from the past. Consequently, in the Republic of Poland and the German Democratic Republic it was not acceptable to preserve the right of individual ownership of means of production, as that type of ownership was supposed to disappear as socialism grew. It should be mentioned that family businesses, as they belonged mainly to the sector of small and medium-sized enterprises, were not subject to the provisions of the law on forced nationalization (in Poland, the Act of January 3, 1946). For this reason, the authorities of the GDR and PPR took other legal measures to liquidate them.

The findings presented here lead to the conclusion that the political restrictions imposed by the communist authorities on the private sector of the economy were reflected in legal regulations that determined the principles of inheritance of individual ownership and rights to own and freely use property. Relevant provisions were included both in the constitution and in the general legislation to which it referred.

2.1 *The East German Case*

The first constitution of the German Democratic Republic was adopted in 1949. It was not a typical constitution of a communist state, as it contained numerous provisions that were characteristic of the Western democratic systems. Researchers have stated that it could serve well the formation of a socialist system but could also be an example of the fundamental law of a democratic state (Burant 1988, 165; Malicka 2021, 318). It included a catalogue of personal rights and freedoms, supplemented with a catalogue of collective and social rights. The provisions contained in the catalogue of personal rights and freedoms were limited by detailed statutory regulations (Malicka 2021, 318). This legal maneuver was enabled by the inclusion of the words “unless an act stipulates otherwise” or “state authority may restrict or withdraw these rights based on the generally binding laws” (Malicka 2021, 318). Because the application of fundamental rights (guaranteed in the constitution of 1949) was made dependent on general acts, the provisions that granted equality of all citizens before the law, equality between men and women, a guarantee of personal liberty, inviolability of the dwelling, confidentiality of correspondence, freedom of expression, or freedom of organization could be limited at the level of legislative acts. Collective rights guaranteed citizens of the German Democratic Republic the right to work, the provision of necessary conditions of life, and rights to rest and leisure, to holiday, and to social care based on the social insurance system.

The economic system of the German Democratic Republic was supposed to guarantee its citizens prosperity and ensure fulfillment of their needs. It is noteworthy that the constitution of 1949 guaranteed an individual entity freedom of economic activity and the development of individual initiative, with support and expansion of social mutual aid and on the basis of suitable economic plans. In the fundamental act, the rights of individual and personal ownership and their inheritance were guaranteed. However, this was subject to the restrictions that execution of the guaranteed rights depended on the fulfillment of an individual’s social duties to the community and that the state had a share in succession. The constitution of 1949 introduced the institution of expropriation, providing a guarantee of compensation and a right of appeal to a court for a person who

felt unjustly treated. Considering that expropriation was related to the aim of socialization (nationalization) of the economy, the process was usually carried out with no compensation. With reference to the operation of individual businesses, the constitution stated that such a form of ownership was transitional, on the way toward an economy based on completely socialized ownership (Malicka 2021, 320). Article 20 of this constitution stipulated that farmers, merchants, and artisans should be supported in developing their private initiative. The constitution of 1949, which did not provide for an independent constitutional judiciary, was in practice ineffective, as was proved many times when the authorities of the German Democratic Republic ignored or breached its provisions (Burant 1988, 165).

The second constitution of the German Democratic Republic was adopted by the People's Chamber (Volkskammer) on March 26, 1968. This was the constitution of a socialist state. It laid down that leadership of the country was in the hands of the working class and its Marxist–Leninist Party (Burant 1988, p. 166). The government wanted to subjugate the economy, so that it would serve the political and economic aims of the workers' leadership. Such provisions precluded the operation of family firms as relics of the past, because individual ownership of means of production was disappearing along with the strengthening of socialism. Thus, the existence of such individual ownership was undermined. In the fundamental act of 1968 it was stated that the national economy was based on socialist ownership of means of production (Burant 1988, 166). In laying down a catalogue of fundamental rights, the constitution made their application dependent on the fulfillment by citizens of certain duties. That meant that the rights granted to an individual were in fact significantly limited. Fundamental rights promoted the formation of a “new, socialist awareness of citizens and identification of their interests with the interest of the state as social community”. They had the character of collective, not individual, rights (Malicka 2021, 325–326). The constitution's apologists would claim: “Socialist rights are original rights with their objective roots in socialist relationships. There is no continuity or convergence between the bourgeois and socialist fundamental rights” (Buchner-Uhder 1969, p. 8). The last sentence perfectly reflects the radical institutional change that had taken place in the German Democratic Republic.

Similar to the constitution of 1949, that of 1968 gave the state the right to bring up children.¹ It was stated that children would be brought up in the spirit of the constitution, to become independently thinking and responsibly acting people who would be able to adapt to life in the community. The role of parents was performed through the operation of parents' councils. Thereby, the social and cultural capital of a citizen of the German Democratic Republic was built, shaping an entity with socialist awareness (Malicka 2021, 324).

Both constitutions established a Supreme Court. The key difference in the provisions relating to this institution was that in the 1949 constitution, the judiciary was independent in accordance with the letter of the law, but under the provisions of the 1968 constitution it was subject to the control of parliament or the Council of State.

It is interesting to note that in the legal regulations in force (we doubt that they were in fact implemented) the provisions concerning inheritance in the German Democratic Republic until January 1, 1976, were based on the Civil Code that had been published in 1896 and entered into force on January 1, 1900. This code remained in force in East Germany until January 1, 1976, the year when the new *Zivilgesetzbuch der DDR* came into force. In the 1976 code, it was stated that socialist property and its growth and protection were the basis for the development of personal property. The source of personal property was the work done for society. It served to meet the material needs of citizens. Personal property included, in particular, income from work and savings, home and household equipment, personal items, items acquired for vocational training, further education, and recreation, as well as land and buildings used to meet the living and recreational needs of a citizen and his family. The chapter on inheritance, although some provisions differed from those of the former Civil Code, did not radically break continuity with the regulations of 1896. This was undoubtedly a success of the legislators of that time. Citizens of the GDR could own personal property, and it could be inherited (e.g., by testament). An important fact was that under the 1976 regulations it was forbidden to own private industrial firms. Thus, the rights of citizens to

¹ Article 37 of the 1949 constitution stated: "The school educates the youth in the spirit of the constitution to think independently, act responsibly, to be able and willing to integrate themselves into the life of the community. As a mediator of culture, the school has the task of educating young people to true humanity in the spirit of peaceful and friendly coexistence between peoples and genuine democracy. Parents are involved in the education of their children through parent councils".

own and dispose of property were limited. That provision in practice made it impossible to build family businesses. The agricultural management system in the GDR was complicated. There was individual ownership of land, which was under the common management of cooperatives (there were three types of farm ownership in the GDR²). Land ownership remained with the individual farmer, implying only minor property rights (*usus fructus*). Inheritance concerned only land ownership.

In accordance with the articles of the still binding inheritance law of 1896, probate proceedings were carried out by national notary offices. A decision of such an office was legally binding without any right of appeal (Grzybowska, p. 306).

The repressions applied by the authorities of the German Democratic Republic against the individual sector of the economy were very sophisticated. Small craft enterprises were repressed by the provisions of the tax law and faced difficulties in accessing production materials. The non-socialized sector of the economy, deprived since the 1950s of access to bank credit for conducting business activity, was given an unexpected and—as it turned out from everyday practice—a very tricky offer. The state, as an institution, offered financial support to the non-socialized sector. The institution of the socialist state, when providing such support to a business from the non-socialized sector, proposed to the owner the establishment of a company with state capital. Thus, the socialist state took on the role of an external investor in the individual enterprise operating in the non-socialized sector. Private firms became limited partnerships, where the individual owner was the general partner and the state was the limited partner. Management and succession were thus regulated. These partnerships, along with most other fully private companies, were nationalized in 1971. A clear advantage of this was that state institutions took control over economic entities in which they had invested some capital (Flade and Kamosiński 2021, p. 168). The German Democratic Republic finally cracked down on the non-socialized sector on December 16–17, 1971, during the fourth congress of the Central Committee of the Socialist Unity Party. The state's share in the industrial sector was increased in

²Farms in the German Democratic Republic were of three types. The first and second types were considered transitional and were to disappear in time as socialism grew. In the first type of collective farms the farmers used only the land jointly, while the buildings were under individual ownership. In the second type the land was again shared, but each member of the farmers' families could use a small, private plot. The third type consisted of entirely collectivized farms (Burant 1988, p. 139).

1972 from 88.9% to 99.9%. Minor service firms, such as food services or artisan workshops, remained in private ownership (Flade and Kamosiński 2021, p. 168). These included tailoring and shoemaking services, firms repairing household appliances, as well as small bakeries. In this way, citizens' access to the service sector was broadened.

2.2 *The Polish Case*

The Constitution of the Polish People's Republic of July 22, 1952, legalized the deprivation of individual ownership and did not provide a guarantee of legal protection for such form of ownership. It was laid down that the Republic, based on binding regulations, acknowledged and protected individual ownership and the right to inherit land, premises, and other means of production belonging to farmers, craftsmen, and homeworkers. However, the provisions omitted small entrepreneurs, merchants, and owners of food services. Consequently, the individual owners of firms other than those mentioned in the act were not granted any rights (Machnikowska 2010, p. 555). This allowed the Polish authorities to reserve the right to liquidate individual facilities that at a given moment were considered redundant or threatening to socialist property relations. Through the whole period of the People's Republic, the law continued to be interpreted on the basis that the existence of a non-socialized sector in the economy was only temporary. The sector was gradually to disappear as socialism strengthened. In other articles of the constitution of July 22, 1952, it was laid down that the personal property of citizens and the right to inherit it were protected by the state. That provision was in line with the communist concept that the only form of ownership was personal ownership. The provisions of the fundamental act did not determine forms of succession (statutory or testamentary) and no limitations were placed on the value of inherited property (Grzybowska 2011, p. 311). In this way, the authorities reserved themselves the right to interfere in matters of succession by implementing limitations and restrictions in legislation. What is more, following from the constitutional provision, "From each according to his abilities, to each according to his needs", it was concluded that the "law of succession must be formed in such a way that acquisition of property, if not based on work, would only be possible in case of the existence of other sufficient prerequisites" (Grzybowska 2011, p. 311). The possibility of freedom to testate was also taken into consideration.

The authorities of the Polish People's Republic, following Marxist–Leninist ideology, strongly criticized the decree on the law of succession issued on November 8, 1946. The decree remained in force until 1964. Its provisions, according to the communist authorities, were rooted in bourgeois mentality. The provision stating that inheritance covered all of the property rights and duties of the deceased was questioned as inconsistent with Marxism–Leninism. Only personal and individual property was to be inherited. Forms of succession (statutory or by will) were then laid down (Grzybowska 2011, p. 311). In spite of the questioning of the decree of 1946, the Civil Code adopted in 1964 maintained in force most of its provisions concerning inheritance. Here, a similar contradiction existed as in the German Democratic Republic due to the application of the Civil Code of 1896. As these legislative measures show, in both the Polish People's Republic and the German Democratic Republic, the continuity of European legal thought was preserved with reference to succession and inheritance. Legislators of past centuries understood the law of succession and inheritance as fundamental rights granted to every human. Human attachment to individual property or ownership grew from the principles of an informal institution, recognized as a tradition.

The concept was aptly summed up in 1946 by Stanisław Cylkowski, president of the Chamber of Industry and Commerce in Bydgoszcz. He urged “doctrinal theoreticians to refrain from detaching their programs from the specific reality and basis on which all social and economic reforms may be executed” (APB, Chamber of Industry and Commerce).

Similar to the German Democratic Republic, the authorities in the Polish People's Republic faced difficulties in establishing principles of succession for individual farms. Importantly, the legislative measures adopted in Poland allowed the establishment of family farms, and that process continued. The principle that individual ownership of land as a means of production was only a temporary right was thus suspended. By the Act of June 29, 1963, on the limitation of division of farms in the Polish People's Republic, specific provisions were introduced on succession with regard to farms. The regulations aimed to prevent divisions of individual farms into smaller ones and the placing of excessive burden on successors due to a requirement to pay back other members of the family. Moreover, the act laid down mandatory qualifications for the successor to a farm, and regulations on the inheritance of land by the State Treasury were expanded. According to one commentator on the act: “The strictly determined qualifications of successors not only conditioned the allocation of a farm as

inheritance, but also conditioned the very fact of inheritance. In case of lack of qualifications, the successor did not inherit the farm, even though he/she was appointed as heir. That was quite a new solution in the Polish law of inheritance. The farm was taken over by the State Treasury” (Grzybowska 2011, p. 312). The legal provisions discussed above are a typical example of state intervention in individual economic activity. Importantly, they were characteristic of both capitalist (democratic) and socialist (communist) states. The state as an institution protected by law the indivisibility of agricultural land on farms and expected specific professional qualifications from the future farmer. In view of the repressive policy of the PPR’s authorities toward the private sector, these regulations could be regarded by society as another form of repression aimed at individual property. State intervention here was based on rational grounds.

The relevance of the act of June 29, 1963, went beyond the letter of law; it was of highly symbolic value. The communist authorities in Poland, in permitting the legal succession of individual farms, allowed the creation of family farms. Together with the capital embodied in the family farm, the successor inherited intangible assets and values, including the tradition of management, ethical principles of work, and the brand of the individual farmer. The act restored principles of market management within a centrally planned and managed economy. On the sidelines of the official workers’ leadership, there emerged a class of individual farmers who followed different ethical and moral rules. Such a break from the socialist economy proved the error in its construction. The weakness of the socialist economy was the firm belief of its ideologists that socialized ownership was superior to individual ownership of means of production.

In the context of statutory provisions in force in the Polish People’s Republic in the 1970s concerning the conduct of economic activity in the non-socialized sector,³ the permission granted to a natural person to conduct economic activity in the non-agricultural sector took the form of an administrative decision, such as registration, permit, or license. The provisions determined two ways of registering a private firm. One of them was confirmation of registration of the business, and the other consisted of

³These regulations consisted of: the Act of June 8, 1972, on implementation and organization of craft; the Act of July 18, 1974, on the performance of trade and other types of activity by entities of the non-socialized economy; the Act of July 6, 1982, on rules on the conduct of economic activity in the Polish People’s Republic in the form of small craft by foreign natural and legal persons; and the Act of February 26, 1982, on entitlement to perform foreign trade.

permission to conduct the business. In the first case, if the enumerated conditions were fulfilled, the authority could not refuse issuance of the confirmation of registration. The conditions to be met were as follows: provision of services for people and agriculture, manufacture of minor consumer goods to supply the market and goods of local or regional character (souvenirs, art) in person or with the aid of family members residing in the same household. In the second case, permission was granted to one or several persons who intended to conduct business jointly. The permit provided the right to employ workers (mostly six, but in the case of a construction firm, eight), and these limits could be increased if certain prerequisites were met. The act stipulated, however, that permission would not be granted if it was considered contrary to the social interest. This was a statement of very broad scope and was thus convenient for the authority issuing permits. The administrative decisions granting permission to conduct individual economic activity were addressed to people who acted outside the state economic order. They were granted to specified persons and were non-transferable. This meant that, in case of the death of a person authorized to conduct individual economic activity, an administrative body could refuse to grant permission to continue the activity to the children and grandchildren of the deceased (Waligórski 1988, p. 95). In this way the authorities prevented uncontrolled succession and the accumulation of individual property in family hands. Thus, individual economic activity in craft, trade, and services could be conducted only in one's own name and on one's own account. If a company was established, it had to be a partnership as defined in civil law, which meant that all partners were obliged to participate in the economic activity. It was impermissible to join the partnership only by contributing capital (Waligórski 1988, p. 86). The law determined the method of personal management of a craft, trade, or service firm. According to commentators, the administrative decision issued in the form of a permit protected the interests of an individual economic activity, as it gave the authorized entity the legal right to develop its business within the scope and according to the rules laid down in the permit itself and in the relevant legal regulations (Waligórski 1988, p. 98).

It should be emphasized here that the communist authorities in the Polish People's Republic did everything they could to ensure that small craft workshops were not inherited. Thus, the creation of family firms was prevented. As mentioned above, in case of the death of a person entitled to conduct activity in craft, trade, or services in the non-socialized sector, the administrative law of the Polish People's Republic did not provide for

extension of the relevant decision to their immediate family. As a result, the firm ceased to exist. On the other hand, the act did not specify any sanctions in the event that heirs continued to conduct economic activity on their account without the prior permission of the competent body (Waligórski 1988, p. 95). The lack of adequate regulations revealed another inconsistency in the legislation. This inconsistency, however, provided an opportunity for citizens to disregard or bypass the binding regulations. Bad legislation, detached from the traditional, real needs of society, was rebuffed by the Poles.

As a result of the legal provisions discussed above, the individual concession granted to a craftsman for conducting business activity, along with a number of additional difficulties related to the repressions resulting from the provisions of tax law and the practice of the tax administration with regard to the so-called tax surcharges, was used by the authorities of the Polish People's Republic to build an atmosphere of uncertainty around the private sector. As a result of this uncertainty, craftsmen did not make long-term investments. They ran a business that met only its current needs. They could not view or plan the future of their firm. It should be emphasized that the communist authorities' policy on the so-called temporary activity of the private sector should be regarded as one of the effective repressions against private entrepreneurs, who gave up trying to create family businesses.

The Act of June 8, 1972, on social insurance of craftsmen, imposed a duty of insurance on craftsmen and people working with them. Social insurance covered medical services, pension, invalidity allowance, family allowance, pension supplement, and funeral allowance. These were paid from a fund of contributions paid by craftsmen and administered by the Social Insurance Institution. That was the first of the acts in the Polish People's Republic which enabled owners of private production firms to retire and opened the way to the so-called tacit succession. In everyday practice, usually with the tacit permission of the authorities, owners of production firms ignored the regulations limiting succession and conducted the succession process by way of administrative procedures. The senior craftsman retired, shut down the business, and obtained a pension from the Social Insurance Institution. At the same time, a qualified junior craftsman (heir), based on an individually granted permit to conduct new economic activity in the non-socialized sector, started his or her own business. This method of succession enabled the avoidance of problems with claiming property rights by inheritance.

The difficult issue of the use of premises by craftsmen constituted a certain limitation on the effective use of individual property in the area of production. The authorities refused to grant permission for the sale of premises to natural persons (Machnikowska, pp. 566–567). They were allowed only to rent. At the same time, craftsmen's rights to build their own premises were limited, even if they wished to use them for the purposes of their own economic activity. This was a deliberate decision on the part of the communist authorities. They did not want the individual owners of means of production to become owners of commercial facilities, because that went against the principle of elimination of the class of capital owners.

The growing economic and political crisis in the Polish People's Republic in the 1980s, related to the erosion of the ruling communist party (the Polish United Workers' Party), the rise of anti-communist sentiments in society, the Solidarity movement, and the strengthening of the anti-communist opposition despite the repression carried out by the authorities, had an impact on the growth of entrepreneurial attitudes in society. The communist authorities, wanting to mitigate the adverse effects of the economic crisis such as shortages of basic consumer goods, softened its political stance toward the private sector. The Act of September 16, 1982, amending the Act on the organization of crafts, gave a new status to the non-socialized sector of the economy. The preamble to this act stated that craftsmanship was a permanent element of the socialist economy. Thus, it was confirmed that in the Polish People's Republic three sectors of ownership could develop on equal terms: state, cooperative, and private. It was declared that the independence and self-government of craft organizations was to be strengthened, and it was stipulated that craft workshops could employ up to 15 persons. As a result of this regulation, the private sector was released from the rigors of central planning (Bałtowski 2009, p. 274).

The regulation of January 31, 1985, on small manufacturing was another instrument through which the authorities of the Polish People's Republic declared the private sector a permanent component of the socialist economy. This assurance, included in the preamble of the legislation, was intended to give the entrepreneurs of the time, pejoratively known as private traders, a guarantee of the safety of their invested capital and accumulated assets. This step was justified by the fact that the authorities wanted to increase the efficiency and effectiveness of the economy. Therefore, the rights relating to the conduct of business activity in small

manufacturing were made equal, regardless of the ownership sector. In an economic system that privileged the state and cooperative sectors of ownership, this was a significant qualitative change. With this move, the authorities of the Polish People's Republic, in the face of increasing shortages on the internal market, resulting from the crisis of the planned economic system, undermined the doctrinal foundations of that system, which had been stubbornly constructed after the end of World War II. Despite many changes that were favorable to the private (non-socialized) sector, the new law retained separate income taxation for the socialized and non-socialized sectors (Konopska-Struś and Muszkiewicz 2010, p. 458). The Act of January 28, 1987, on counteracting monopolistic practices in the national economy completed the changes that loosened the doctrinal framework of the socialist economy.

The Act of December 23, 1988, on economic activity, untypically adopted by the Sejm of the Polish People's Republic, disrupted the existing economic order that was dogmatically defended by the communist authorities. The adoption of that act should be regarded as the first step taken by the then political regime toward changing Poland's economic system. The new law represented a powerful modernizing force, giving entrepreneurs the right to run a business on an equal footing with state-owned enterprises. The three ownership sectors—state, cooperative, and private—were made equal in law. Entrepreneurs were given the freedom to choose the legal form of self-employed business activity. The law stipulated that starting and running a business was free and allowed to everyone on equal terms. For fear of social reaction to the act, the concept of entrepreneur was not included in its wording. In the Polish People's Republic, the communist authorities ensured that the term “entrepreneur” was given the pejorative connotation of entrepreneur-privateer. Hence, in the Act of December 23, 1988, a less controversial term, ‘economic entity’, was used. The economic entity, as a concept, encompassed both natural and legal persons. An important change compared with the previous legal order was the granting to economic entities on equal terms, regardless of the form of ownership, of the right to have an unlimited number of employees, as well as access to bank loans and the supply of means of production.

The 1980s, perceived as a time of deepening collapse of the centrally planned economy in the Polish People's Republic, paradoxically turned out to be a period conducive to the development of the non-socialized sector. The private sector—flexible, innovative, economically effective,

according to Schumpeter's principle that a crisis is an opportunity for daring entrepreneurs—won out in the competition with the sluggish, inflexible behemoths of socialist industrialization. In 1981, there were approximately 357,100 business entities registered for non-agricultural economic activity. They employed around 654,100 workers (about 1.8 employees per firm on average). During the 1980s, the Polish government approved the development of private initiative, one result being that the average employment rate per private firm had increased to 2.2 employees by 1987. It should be noted that in 1986 more than one million people were employed in the private sector, and the number of firms was growing at a very fast pace. In 1987 the number of firms was 530,400, an increase of 173,000 over 1981. Maciej Bałtowski explains this abrupt increase in the number of private enterprises by, among other factors, the “atmosphere of growing negative attitude towards the socialized economy” (Bałtowski 2009, p. 274).

Although the political stance toward private initiative eased from the 1970s and 1980s, very few craftsmen-entrepreneurs—negatively referred to as “private dodgers”—dreamt of preparing successors to take over their businesses. The profits that could be earned from economic activity conducted on one's own account were huge. The majority of craftsmen did not assume that, in the legal conditions of the Polish People's Republic, their operations would be transferred to their heirs. For this reason, they limited their investments. Many firms in those times operated in a one-room flat, a basement or cellar of a tenement house, or a garage. The profit generated was exchanged for Western currency or gold, or simply consumed.

3 THE CONCEPT OF FAMILY COMPANY BRAND

In the society of the German Democratic Republic, as a result of the persistent propaganda against entrepreneurs that had been carried on since the end of World War II and ended with the nationalization of enterprises, there was no space for the restoration of so-called historic brands, often associated with family businesses. It was considered that these had been discredited during the war. Moreover, the restoration of traditional brands in the Federal Republic of Germany gave the authorities of the German Democratic Republic new arguments for intensive actions aimed at breaking with the past and forming a new socialist state. Most of the renowned brands, recognized mostly in local environments and existing in small craft

sectors, were eliminated. These were brands which customers used to associate with family companies, providing bread, groceries, or small services, and were mostly based on their owners' names.⁴

Historic brands existing in the economy of the Polish People's Republic, as in the GDR, were associated with family businesses. In the PPR they were usually synonyms for luxury and good taste and confirmed the link between family businesses and the history of the place in which they operated. They included such brands as Ludwisarnia Felczyńscy (a bell foundry), founded in 1808; A. Blikle (confectionery), from 1869; Pracownia Obuwia Jan Kielman (a footwear factory), from 1883; Szajek Przetwórstwo Mięsa (meat processing), from 1905; Foto Garzyński (a photography firm), opened in Cracow in 1918; and Cukiernia Zakryś (confectionery), founded in 1919 in Tuchola. The historic brands preserved in collective social memory, and the uninterrupted operation of family firms that were not disturbed by the communist persecution of the private sector, were uncharacteristic phenomena for the socialist bloc. To explain them, one may quote the words of Jean-Paul Sartre, who, on visiting Poland in 1960, referred to "the country detached from its own past by communist forces, but so strongly attached to the past that it rebuilds the ruined capital city based on Canaletto's paintings" (Davies 1991, p. 766). Norman Davies, a renowned historian, observed that a characteristic feature of the Polish people was that "most Poles are just by disposition 'against'" (Davies 1991, p. 766).

4 TIME OF ESTABLISHMENT OF FAMILY BUSINESSES OPERATING IN POLAND IN 2019

Of the family businesses operating in Poland in 2019, 30.4% were established between 1951 and 1990, in the era of the Polish People's Republic. This period can be divided into two subperiods: 1951–1980, in which 7.4% of family firms operating in 2019 were established; and 1981–1990, accounting for 23% (see Table 7.1).

⁴Daron Acemoglu and James A. Robinson write: "Each community functions according to a set of economic and political rules implemented jointly by the state and society" and the adopted "economic institutions determine economic stimuli encouraging to study, save and invest, implement innovations, apply new technology, etc. Each radical institutional change may severely hamper the institutional order created throughout the years" (Acemoglu and Robinson 2014, p. 54).

Table 7.1 Percentages of family firms operating in Poland in 2019 by age (based on research conducted by the Polish edition of *Forbes* in 2019)

<i>Date of establishment</i>	<i>Percentage of firms</i>
1921–1930	1.5
1931–1940	3.0
1951–1960	3.0
1961–1970	2.2
1971–1980	2.2
1981–1990	23.0
1991–2000	41.5
2001–2010	17.0
2011–2019	6.6

Source: “Special report: Family businesses in Poland. State, opportunities, challenges”, *Forbes*, January (2020, p. 100)

In the period 1951–1980 in the Polish People’s Republic a group of determined persons appeared who, contrary to the intentions of the then communist authorities, undertook economic activity and built solid foundations for their company. They never perceived their “private business” as a temporary adventure. Their vision was motivated by the demand of the market for the creation of brands, whose advantage would be anchored in values associated with the family firm. The entrepreneurs of those times introduced their own original production technologies and searched for previously unknown design solutions. These firms included, among others: Grycan–Lody od Pokoleń (ice-cream factory), founded in 1946 in Wrocław; and Cukiernia i Piekarnia Adam Sowa (pastry/bakery), which was set up in Bydgoszcz in 1946 and underwent a succession process in 1982. In 1972 another food manufacturing firm was founded—Roleski (Kamosiński 2021, pp. 85–86).

The few (as shown by statistical data) family businesses that survived during the three difficult decades of 1951–1980 lasted on the internal market of the communist state only thanks to the determination and consistent management of their owners. Despite the obstacles posed by the law, they survived. Favorable changes came in the 1970s, when the growing economic crisis, combined with the country’s growing foreign debt and the deteriorating public mood, made it easier for craftsmen to make decisions about the continuation of their businesses. They were the beneficiaries of the shortage economy, being practically guaranteed unlimited sales of their products. The 1970s, known as the decade of Edward Gierek,

opened access to social insurance and pensions for craftsmen. This was a breakthrough in the social policy of the Polish communist state, considering that at the same time in the GDR the communist authorities were doing the opposite, having decided to liquidate the private sector of the economy.

The family businesses built up in the Polish People's Republic in the 1980s operated in a period of frequent and unsuccessful reforms of the socialist order implemented by successive governments (Grala 2005). These firms included MB Pneumatyka, founded in 1984 by engineer Andrzej Bieniaszewski, a constructor of joints for pneumatic breakage systems; Laboratorium Kosmetyczne dr Irena Eris (cosmetics laboratory), founded by Irena Eris in 1983; and Bandi Wytwarzanie Artykułów Kosmetycznych (cosmetics manufacture), set up in 1986 by Bogda Draniak. Sociologists' research on the attitudes of Polish society toward private economic activity in the 1980s leaves no illusions. Mirosława Marody noted that in that decade there was a phenomenon which she described as the appreciation of self-employment. As a result, "business centered around one's own interests with the use of a complex network of connections and arrangements requiring constant maintenance" was observed (Marody and Lewicki 2010, p. 107). Winicjusz Narojek pointed to the birth of what he called 'little individualism', which initiated "the process of constructing individual strategies of action, disregarding the rules and norms that were to organize the cooperation of the communist society, and thus also identification with the institutional order established by it" (Marody and Lewicki 2010, p. 107). This state of awareness provides a convincing explanation of the fact that as many as 23% of family businesses operating in 2019 were founded in the years 1981–1990.

The family firms that were set up in the Polish People's Republic, against the intentions of the communist authorities, constituted a vehicle for the social and cultural capital that shaped their owners and successors, under the influence of past experiences and awareness of the successes and failures of their predecessors. Those firms worked out their own solutions for cooperation with other people and organizations, creating networks of connections and business relations. Their existence despite the unfavorable political conditions, where individual ownership of means of production was considered transient as socialism strengthened, gave them power and enabled them to continue their operations after the institutional watershed of 1989.

5 SUMMARY

A family business is a specific type of economic organization where the legacy of the past forms the future. It cannot be detached from its identity. It grows on its founder's", often shaped throughout the decades. The continuity of family management and growth in the material and non-material resources of these firms were nevertheless contrary to the principles implemented in 'people's democracy' concerning the formation of a new socialist man brought up on the basis of Marxism–Leninism. For the communist authorities in Poland and East Germany, family firms were enemies to be tackled. Considering that these firms usually belonged to the sector of small and medium-sized enterprises, their liquidation required a wide range of new legal regulations, including in the sphere of inheritance and succession.

An interesting phenomenon observed in the Polish People's Republic and the German Democratic Republic was that the law of inheritance was not inwardly separated from the European legal tradition, reaching back to Roman law and the Napoleonic Code. This applies both to the Civil Code of 1896 that remained in effect in the German Democratic Republic and to the decree on inheritance law enacted in 1946 in the Polish People's Republic. The measures adopted were criticized by advocates of communism as going against Marxist–Leninist doctrines, but they were nevertheless applied. The constitutions in effect in the Polish People's Republic and the German Democratic Republic must be analyzed differently. The fundamental acts of both states were drawn up under the tight control of communist politicians, particularly in the case of two of them: the Constitution of the Polish People's Republic of 1952 and that of the German Democratic Republic adopted in 1968. The Constitution of the German Democratic Republic of 1949 was referred to as a temporary, transitional act, and many of its provisions were regarded as inconsistent with the principles of the new order. In the case of both the Polish constitution of 1952 and the 1968 Constitution of the German Democratic Republic, a similar observation can be made: both acts were treated as instruments by the authorities. Their legislative impact was insignificant, due to the lack of a constitutional judiciary. It should also be noted that in these two countries there was no administrative law and no administrative courts were established. A citizen could not sue the state if he or she felt unjustly treated by decisions made by state institutions.

In both states, another point requiring deeper analysis was observed, namely the incompatibility of formal and informal institutions in case of institutional change. Observing the pace of the changes introduced by the communists in the space of formal institutions, one observes the phenomenon of historical acceleration (Staniek 2017, p. 91). Changes to the formal rules operating in political and economic life, imposed by way of legal regulation, but displaying a lack of conformity with the informal rules adopted by society, naturally led to a collision. As a result, the deepening conflict between the formal and informal institutions led to a situation where the letter of the law was bypassed or ignored in everyday life. In the German Democratic Republic there was a visible problem with regulation of the inheritance of individual land ownership in a system that included three types of cooperatives. In the Polish People's Republic the law in force allowed the creation of family farms, but at the same time hampered the succession of family firms in the manufacturing and service sectors. It seems that the communist authorities found it most challenging to tackle the long-established institutions, such as tradition and custom, and the rules of conduct of individuals and families based on those values. In the German Democratic Republic the authorities attempted to destroy these values by imposing a greater degree of control than in Poland over the family and children's upbringing. Probably a significant factor in the Polish People's Republic was the Catholic religious tradition. Disobedience to formal institutions, which was weaker in the German Democratic Republic, remained very strong in Poland. It was in the Polish People's Republic that in 1980 the Solidarity revolution started, later gaining the momentum that would produce a snowball effect across the states of 'people's democracy'.

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Taking Part, Apart: Inclusion of Researchers from the German Democratic Republic in Their International Scientific Communities

Jochen Gläser and Grit Laudel

I INTRODUCTION

This chapter discusses opportunities for researchers from the German Democratic Republic (GDR) in two disciplines to become recognised members of their international scientific communities. In doing so, this chapter addresses a paradox that has emerged from the literature. All accounts of research conditions in the GDR agree that there were substantial constraints for research in the GDR. Buildings, infrastructure, and

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equipment were outdated and in bad repair. Materials necessary for research were difficult to obtain and often impossible to obtain in time. International communication was hindered by problems with access to literature and severe travel restrictions, which made attending conferences and stays for research abroad impossible for most researchers. In addition, research came under increasing pressure to contribute to economic growth by generating innovations for the GDR's industry (e.g., Mayntz 1994b; Gläser and Meske 1996).

These well-documented adversities suggest that internationally recognised research should have been impossible. However, this is not what the numerous evaluators of the GDR's research have found. In addition to work on irrelevant and obsolete topics (which were often directly tied to the technological level of the GDR's economy), internationally relevant research of high quality has been found across all scientific disciplines (Mayntz 1994b; Wolf 1995; Kocka and Mayntz 1998).

The question of how researchers in the GDR could make relevant and reliable contributions to the knowledge production of their international scientific communities under such conditions has not yet been fully answered. The literature on the GDR's science system and its transformation in the course of German unification has focused at the aggregate level on the conditions under which researchers in the GDR worked and on the transformation of the East German science system (Meske 1993; Mayntz 1994a, b; Wolf 1995; Gläser and Meske 1996; Kocka and Mayntz 1998; Mayntz 1998; Mayntz et al. 1998). With few exceptions, its emphasis has been on the reconstruction of conditions under which the GDR's researchers worked and the change in these conditions that accompanied German unification. How researchers managed to conduct internationally competitive research in the GDR has found less attention.

Our perspective on the GDR's research differs from previous analyses in its consideration of researchers in their role as members of international scientific communities. In most fields of the natural and social sciences and humanities, research is a collective transnational enterprise that advances a shared body of knowledge. The extent to which members of these communities can contribute to the advancement of their community's knowledge depends on their local working conditions, which are shaped by the country they work in and its international relations. Thus, the conditions for research as provided by the GDR and as shaped by the GDR's international relations enabled and constrained the inclusion of researchers in the knowledge production of their scientific communities. We ask how

researchers in two fields—semiconductor physics and molecular biology—managed to contribute to their communities’ knowledge production under adverse conditions.

This discussion is based on a larger project studying the impact of research conditions in the GDR of the 1980s on careers before and after German unification. This larger context introduces a bias in the analysis presented here due to its focus on researchers who had the opportunity to continue their academic career after German unification. This was a minority; only about one-third of the GDR’s R&D personnel could continue their career in East Germany after German unification (Meske 1993). While the project is intended to arrive at more general conclusions about research conditions in the GDR’s universities and research institutes of the Academy of Sciences, most findings discussed in this chapter are applicable only to those researchers who had a career before and after unification.

The perspective on levels of inclusion under adverse conditions nevertheless positions the GDR’s research in a wider theoretical framework and thus renders it comparable to situations that existed or exist in other countries. We present this theoretical perspective (Sect. 2) before describing the empirical investigation (Sect. 3) and the GDR’s science system (Sect. 4). We then describe in detail the conditions under which researchers worked in the GDR and provide an overview of levels of inclusion in semiconductor physics and molecular biology (Sect. 5). Based on interviews with researchers from these fields, we show how field-specific conditions enabled high levels of inclusion (Sect. 6). Some preliminary conclusions about the field-specific character of constraints on inclusion and about the applicability of this perspective to research in other countries are drawn (Sect. 7).

2 THEORETICAL BACKGROUND

One of the core insights of the sociology of science is that scientific knowledge is collectively produced by scientific communities. According to a basic model that can be traced back to Fleck (1979 [1935]), Kuhn (1962), and Polanyi (1962), members of a scientific community jointly advance a body of knowledge by observing it, deriving research problems from it and solving these problems. They offer the solutions to these problems to their fellow community members as contributions to the knowledge that can be used in further problem-solving. Some of these offered contributions become integrated into the community’s knowledge by being used

and thus adapted to subsequent problem-solving processes (Whitley 2000 [1984], 11–13; Gläser 2019, 421–3).

This highly abstract model identifies the basic mechanism that coordinates the collective production of scientific knowledge and the social phenomenon that constitutes membership in a scientific community. Communal knowledge production is ordered by community members' reference to a shared body of knowledge, and their identity as community members is based on the perception that they share with other members a commonality in advancing that knowledge. In order to be a researcher, one needs to be a member of a scientific community, that is, part of a larger producing collective. This collective and the body of knowledge it advances are the primary referents of researchers (Gläser 2006).

This model of the coordination mechanism, and much of the sociological research on scientific communities until the late 1960s, treats all members of a scientific community as equal. Empirical research has since proven this assumption to be false. The identification of differences between community members began with research on the stratification of scientific communities and the role of the scientific elite (Merton 1968; Zuckerman 1970; Cole and Cole 1973; Mulkey 1976). Not much later, the limited participation of women in science and its causes became a central topic of science studies (Zuckerman and Cole 1975; Cole 1987; Zuckermann et al. 1991). Some researchers have also pointed out the discrimination against minorities (Long and Fox 1995). A discussion about research in the Global South being marginalised and subordinated to priorities set in the Global North emerged not only within science studies (e.g., Kreimer 2022a, b) but also in many scientific communities in reflecting on their biases (Binka 2005; Connell 2006; Keim 2011; Acharya and Buzan 2017).

These findings and discussions show that perceiving oneself as a community member says little about one's opportunities to execute this membership role through participation in the community's knowledge production. This is why it is necessary to concretise the concept of community membership by distinguishing levels of a member's inclusion. *The inclusion of a researcher in their scientific community describes the extent and the ways in which they can execute their role as a community member.* Thus, inclusion in a scientific community is a variable and may vary in the following four dimensions, which represent the expectations that define the membership role:

- (1) community members are expected to produce relevant contributions, that is, contributions that meet the quality standards for becoming an addition to the community's knowledge and that are of use to other community members;
- (2) community members are expected to communicate their offers of contributions to the community;
- (3) community members are expected to support the community's communication by organising scientific meetings and by participating in them; and
- (4) community members are expected to participate in the community's decision-making, for example, as reviewers of others' plans (project proposals), through offers of contributions (manuscripts) or bids to continue their career (job applications), and by participating in other collective decision-making (e.g., that of scientific associations).

The expectation to produce relevant contributions and to communicate them shapes the opportunities to meet the other two expectations because they determine the visibility of a researcher to their community. The extent to which these two expectations are met can be used to distinguish three levels of membership. *Silent* members observe the community's knowledge production without participating in it. They derive research problems from the community's knowledge but do not offer their solutions to the community. *Ignored* members offer their findings to the community without the community perceiving them. Common reasons for contributions being overlooked include publication in scarcely read journals and a reputational bias: if the authors are not known to readers, their publications are unlikely to be read. *Recognised* members are those whose solutions are referred to by other community members or who are included in community-wide collaborative networks of problem-solving. Only recognised members contribute to the community's knowledge production.

Becoming a recognised member involves an additional affirmation of a researcher's identity. Membership in a scientific community is foremost a matter of perception: somebody is a member if they perceive themselves as working with the community's knowledge and attempting to contribute to that knowledge (Gläser 2006). This identity is fragile for silent members but is stabilised for ignored members by their attempts to contribute to their community's knowledge production. Recognised members experience an additional external affirmation of their membership because their work is communicated about or because they contribute to

collaborative work. In both cases, other community members perceive them as members and communicate that perception. This public affirmation is important to a researcher's identity. It is also the minimum reputation a community member can have. Higher levels of reputation are built when the community develops a collective (and thus public) perception of the number, quality, and relevance of a member's contributions.¹

The conditions that affect a researcher's inclusion are controlled by a variety of actors inside and outside the scientific community. Opportunities to produce relevant contributions depend on the availability of time for research as well as access to suitable equipment, materials, research objects, support staff, and collaborators. This access not only depends on finances but may also be restricted by trade barriers or state regulation. For example, German educational research was hindered for a long time by the decision by German federal states in the 1960s not to grant researchers access to classrooms anymore, a decision that was rescinded only in the early 1990s (Gläser et al. 2014, 283–4). Access to collaborators may be hindered by a lack of reputation (others might not want to collaborate), a lack of funding (e.g., for travel), or visa restrictions. These factors also co-shape opportunities to communicate and to participate in the community's decision-making. A low reputation may diminish chances to publish in leading journals, to become a journal editor, to act as a reviewer, to participate in organising conferences, or to take up positions in professional organisations. Attending conferences and meetings may be impossible due to insufficient funding or visa restrictions. An additional important factor affecting the execution of all membership roles is one's ability to communicate in English, without which a researcher's opportunities are severely limited.

A researcher's inclusion in their scientific community may also be hindered by decisions of other community members. Decisions by editors, panel members, reviewers, readers, and potential collaborators have been shown to be biased against women, researchers from the Global South, researchers from particular countries, or minorities inside and outside their own country (Lee et al. 2013). In addition to these biases, the attention among most researchers in the Global North to only a few journals and conferences renders many researchers, particularly in the Global South, invisible. Although this narrow focus on a limited number of

¹The idea for this distinction and its connection to recognition and reputation emerged in a discussion with Helene Sorgner.

communication channels is a collective response to information overload rather than intentional discrimination against other community members, it effectively excludes most of them.

3 DATA AND METHODS

3.1 *Approach*

We study the impact of the conditions under which researchers worked in the GDR on their inclusion in international scientific communities in the last decade of the GDR, during the transformation period in the early 1990s, and afterwards. We conducted studies of “nested cases” (Patton 2002 [1990], 240), with cases selected at the field, organisational and researcher levels.

At the field level, we selected two fields from the sciences that are likely to have been affected in different ways by the conditions prevalent in the GDR. Semiconductor physics was given a high priority by the GDR’s science policy due to its role as a scientific foundation of the semiconductor industry. Molecular biology is likely to have been particularly sensitive to restrictions on international communication and collaboration because it was a rapidly growing field in the 1980s.

From each field, we selected five research organisations (two institutes of the Academy of Sciences and three universities) for the study of patterns of inclusion and one institute of the Academy of Sciences and one university department for the reconstruction of inclusion biographies. Participants for the latter investigation were identified through bibliometric analyses (which allowed us to find researchers who published both before and after German unification), through archival records of the institutions, and by further recommendation from interviewees.

3.2 *Data Collection and Analysis*

Our analysis utilises three main data sources. *Bibliometric analyses* based on publications indexed in the Web of Science (WoS) were used to reconstruct publication histories of researchers and to obtain information about topics researchers worked on and their change over time, institutional affiliations of researchers, and the dynamics of their international collaborations. For the analysis presented in Sect. 5.2, we examined patterns in inclusion biographies of 150 randomly selected researchers in

semiconductor physics and molecular biology at five institutions: 10 researchers from three universities and two institutes of GDR's Academy of Sciences in each field, all of whom continued their career after unification; and five researchers from each institution who did not continue their careers.

The sample was drawn from all researchers from these institutions who had at least one publication indexed in the WoS and had completed their PhD in the early 1970s or later. We included different career stages (researchers who started their career in the 1970s as well as researchers who started their career in the 1980s). We collected each researcher's publications from the beginning of their career until 1990 and counted the number of articles citing these publications in the same period. A count of citing articles provides a more accurate picture of recognition than pure citation counts. If a researcher receives multiple citations in one article, they are still visible only to the authors of that one article.

The inclusion of only those researchers who published at least one paper indexed in the WoS did not lead to bias by excluding those whose publications were not indexed there. We tested this by additionally searching for publications of researchers from the five institutions using Google Scholar, annual reports of the institutions, and archival sources. It turned out that if scientists in the two investigated fields published at all, they tended to do so in indexed journals.

While researchers who published at all also tended to publish in journals indexed in the WoS, our approach excludes from consideration all researchers who did not publish. Most of these completely silent researchers likely conducted research for industry or for the military. Since the only way to find them is through archival records, many of which were not accessible at the time of data collection, it is not possible to tell how many of these "absolutely silent" members of scientific communities worked at universities or Academy institutes of the GDR.

The main source of information for the reconstruction of conditions where researchers worked are *archival records* of the respective organisations. These records were accessible—albeit with some difficulty—for the institutes of the GDR's Academy of Sciences. In universities, many records from the time before 1990 were missing due to turbulence in the transition period or not yet accessible due to staff shortages in archives.

Information about the conditions individual researchers experienced and about their inclusion biographies was elicited primarily through *biographical interviews*. Interviews were supported by the reconstruction of

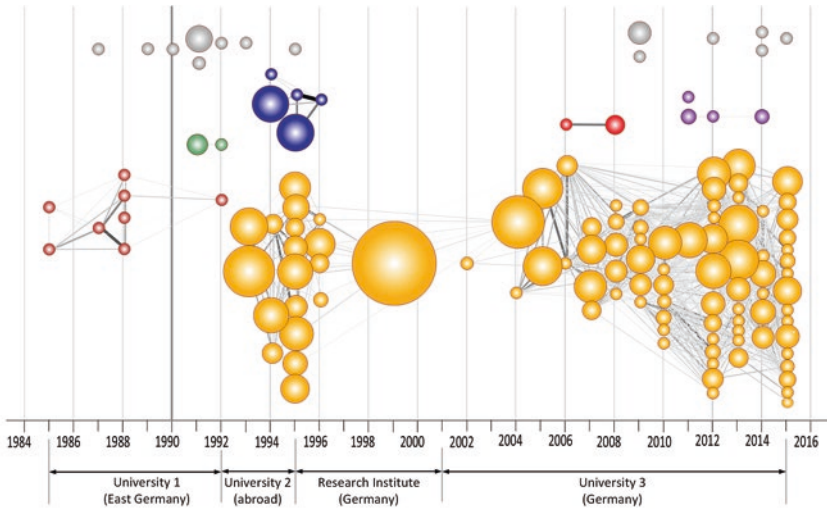


Fig. 8.1 Research trail of an East German researcher (The circles are publications, the size of the circles indicates the number of citations, the lines show thematic connections between publications and colours indicate different topics)

interviewees' research trails, a graphical representation of which was used in the interview to stimulate narratives (Gläser and Laudel 2015). Figure 8.1 shows an example of such a research trail. Interviews addressed the development of an interviewee's research topics throughout their active career, the role of collaborators, and the material conditions for research such as access to equipment and literature, publication opportunities, and participation in activities of their scientific communities such as review tasks. The interviews were analysed using qualitative content analysis (Gläser and Laudel 2013, 2019).

Since the empirical investigation is still ongoing, we use the information obtained from bibliometric analyses, analyses of archival records and interviews to provide a preliminary account of the conditions under which GDR researchers managed to become recognised members of their international scientific communities and the practices they used to achieve this level of inclusion. We reconstruct influences on the selection of research problems by discussing the dynamics of researchers' autonomy, interests,

and research conditions. We conducted 14 biographical interviews and complemented them with secondary analyses of 13 interviews that were conducted in the 1990s in two other projects (Gläser 2000; Laudel and Valerius 2001).

4 THE GDR'S SCIENCE SYSTEM

The GDR's science system was structurally similar to that of the Federal Republic of Germany (FRG), although the shares of components differed (Table 8.1). In both countries, industrial R&D was the largest sector and state-funded research institutes made up a significant proportion of publicly funded research. The state-funded non-university sector was larger in the GDR and consisted primarily of research institutes of the GDR's Academy of Sciences. The higher education sector was the smallest of the three.

The GDR's higher education system consisted of very few universities and many specialised institutions. Of the 54 higher education institutions, only 9 were universities, while the rest were specialised in technology and engineering (15), medical sciences (3), pedagogics (9), arts and music (12), and agriculture, economics, legal studies, and sports (6) (Buck-Bechler 1994, 18). The main component of the GDR's state-funded non-university sector was the Academy of Sciences, which in 1990 comprised 60 institutes with about 24,000 employees (Mayntz 1994b, 41–42).

At the time of German unification, the relative sizes of the two public research sectors in the GDR gave rise to the myth that little research was conducted in the GDR's higher education sector. This was not the case. An analysis of WoS publications from 1984 shows that the higher

Table 8.1 Research systems in East Germany and West Germany prior to unification

	<i>GDR 1989</i>	<i>FRG 1987</i>
Industrial R&D (%)	61.3	70.5
State-funded non-university sector (%)	26.9	13.5
Higher education (%)	11.8	16.0
Total number of employees	140,565	419,205

Source: Table 2.1 from Mayntz (1994b, 40), our translation

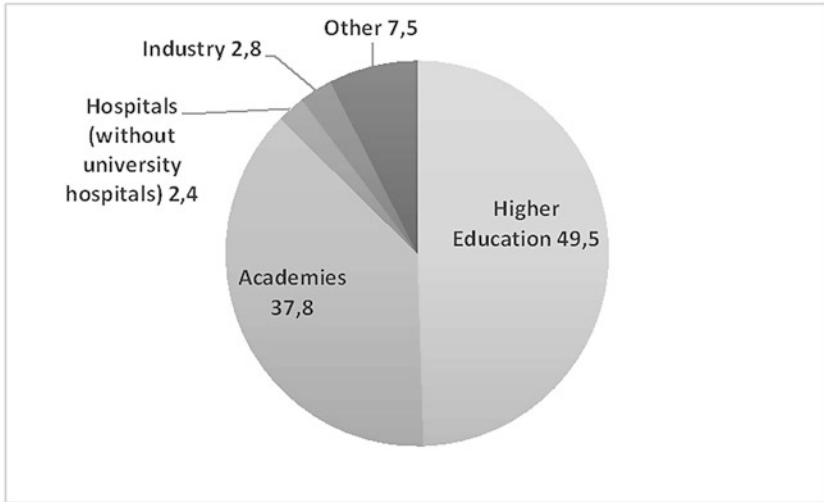


Fig. 8.2 Shares of GDR publications indexed in the WoS in 1984 (Data from Weingart et al. (1991, 26))

education sector had the highest share in publications with a GDR address (Fig. 8.2).

The governance structure of the science system in the GDR was characterised by hierarchical management. The chain of command flowed from higher-level managers down to lower-level managers, with department heads supervising researchers. The ministry of higher education oversaw university rectors, who in turn directed department heads, who directed academics. Similarly, the Academy of Sciences was subordinated to the ministry of science and technology and had an equally strong, but more complex, internal hierarchy. Academic managers in both sectors had to negotiate with the communist party, which had its own parallel hierarchy of party secretaries and wielded significant influence over decision-making processes. This system left little room for academic self-governance.

The major political expectation confronting research in the GDR was that it should contribute to societal development, which for most research translated to an expectation that it contributes to industrial innovation. Particularly in the 1980s, there was immense pressure both at universities

and at state institutes to do contract research for industry. The Academy of Sciences was expected to fund half of its research through such contracts, which it never achieved (Gläser and Meske 1996, 126–35). The maximum share of funding from contracts with external partners was 44.7% in 1989 (*ibid.*, 130). In 1988, 44% of the natural sciences and engineering in the higher education sector were funded from contracts with external partners (Buck-Bechler 1994, 25).

Despite these pressures, many researchers in the GDR maintained some degree of autonomy. Several factors contributed to that autonomy. First, some researchers were interested in conducting applied research and contributing to industrial innovations, that is, their interests coincided with political demands. Although these researchers may have been limited by a lack of equipment and materials, they were not pressured to change their research topics. Second, certain fields of research, such as pure mathematics or theoretical physics, do not lend themselves easily to supporting industrial innovations, which afforded researchers in these fields more autonomy. Third, demands for application-oriented research needed to be translated into research problems, which required scientific expertise. In some cases, only the researchers possessed the necessary expertise, and tasks had to be negotiated with them. In other cases, superiors also had such expertise and sought to accommodate their researchers. Fourth, most researchers had permanent contracts that were very difficult to cancel, and thus negotiated their activities from positions of relative security.

5 INCLUSION OF EAST GERMAN RESEARCHERS DESPITE ADVERSE CONDITIONS

5.1 *Research Conditions in the GDR*

Research conditions in the GDR were not internationally competitive, and in some cases not even competitive when compared to those in other socialist countries. Domestic resources were scarce due to generally insufficient supply and because the science system took a lower priority than the economy and often also the consumer sector. Foreign currency, which was extremely scarce, was essential for buying international journals, paying membership fees of international scientific associations, attending conferences, funding stays abroad, and buying equipment and materials for research. Acquisition of both domestic and international resources was

severely hampered by the central planning system, which required researchers to submit their resource requirements two years before they started their research. The planning system also introduced a significant element of chance in the supply process because it was by no means guaranteed that anything ordered two years ago would be delivered when it was needed. This was particularly problematic for research in which demands for reagents emerged in real time:

Interviewer: Why didn't you pursue the [topic] anymore?

Well, there were many reasons. We could not make progress technologically because we could not acquire the necessary equipment. It did not exist in the GDR and Western equipment and reagents could be in principle obtained but this was by no means easy, particularly in the short term.

The best planning of a reagent to be imported in one- or two years' time, if at all, is useless when I need it now for my next experiment.

As a result of the insufficient, slow, and unreliable supply of resources, research was conducted under difficult material conditions. In the 1980s, only one-third of the buildings of higher education institutions were in good repair according to the GDR's standards, while 12% were seriously damaged. The equipment did not meet the requirements of teaching and research, with 40% of the equipment in use having already been written off (Buck-Bechler 1994, 27). An investigation at the Academy of Sciences in 1986 found that its most important research was conducted with equipment that had been introduced internationally 9.1 years earlier. On average, equipment was bought five years after it had become available internationally and was four years old when the investigation took place (Meier 1990, 146).

On top of these restrictions came the US-led advanced technology embargo, which affected much of the research in the GDR. The GDR could not keep pace with the rapid development of computer technology, particularly with the move from mainframe to personal computers, nor could it buy the technology because it was under embargo. Researchers worked with desktop computers they bought privately or with the few computers that somehow made it into the country despite the embargo. However, research topics were abandoned, and other research was slowed down due to the lack of embargoed equipment.

This topic did not end internationally but the method with which it was approached changed. You could do straightforward calculations for which you needed very few parameters, but which were numerically demanding. And we did not have a computer for this. They were on the rise internationally and I could not keep up. This would have been like competing on an old grey horse against a tractor. The others all had tractors, I had only the old grey, so you are not taken seriously.

Domestic political restrictions and scarcity of funds severely limited international communication and collaboration. Spontaneous informal communication with colleagues from Western countries was not permitted; each contact had to be approved upon request. It was very difficult to attend conferences in the West or to undertake stays at laboratories in other countries because these opportunities were scarce due to financial limitations, required long-term planning, and were subject to an extended approval procedure which included checks of political reliability. The latter meant that not all researchers were permitted to travel to Western countries. For regular travel to Western countries, researchers had to obtain the *Reisekader* status (the state, party, and secret service clearance for traveling to Western countries). Individual trips could be applied for without this status but were subject to extensive scrutiny. In any case, applications for travel could be rejected without reasons given and without an opportunity for researchers to appeal.

In 1978 I could have given a presentation at the semiconductor conference [in Edinburgh]. Even my boss said he doesn't want to do it; I should do it. And everything was perfect, paperwork and all. And then came the message from above: "You cannot go." And that was that.

Access to journals from Western countries was less restricted but took time and did not include all journals. Researchers refined the practice of asking for reprints of articles.

The original articles we could access through the library in most cases. For the less well-known journals we could access *Current Contents*, these small booklets published by Eugene Garfield that included the addresses for requesting reprints. Once a week, mostly Friday afternoon, you went to the library, went through *Current Contents* and returned with a stack of 20 requests for reprints. You sent these off and actually got 10 preprints, a return rate of about 50%.

Previous studies, our own interviews, and archival records paint a complicated picture of the publication practices of GDR researchers. For science policy, research in support of industry had clear priority and international publications came second (Gläser and Meske 1996, 359–360). The publication of results from contract research for industry was restricted (Gläser and Meske 1996, 252, 268, 209–10). The priorities of many researchers were affected by the decoupling of careers from publication activities. Most academics in the GDR had permanent contracts, and professional mobility was low.

Publishing was also influenced by supervisors who could direct researchers to certain journals. Publishing in international journals was also made difficult by an extended bureaucratic procedure, with researchers having to submit the manuscript along with an application for the right to publish it in an international journal. The process could take several weeks, and responses ranged from approval without comment to demands to rewrite parts of the manuscript to outright rejection of the application.

Well, you had to get approval to publish there. This always depended on how dedicated and influential your superior was. When he was engaged and influential, then it went through. But when he was a good but careful superior then it was more difficult. Then, he would say, “Publish this in the Moscowian journal first.” (Biologist)

Finally, there was no foreign currency available to pay page charges for publications. In the 1980s, many journals (e.g., the journals published by the American Institute of Physics) introduced such fees. While this was intended to be a request for a voluntary contribution (Trigg 1981), researchers in the GDR (and obviously some researchers in Western European countries as well) felt discouraged from publication in these journals if they could not raise the money for the page charges. Other researchers from the GDR simply sent in their manuscripts and asked for the charges to be waived, which often was successful.

I don’t know how it was with Western journals. In many cases there were publication charges. This did not work at all. *Physical Review*, for example, 30 dollars per page, maybe some illustrious people from the GDR could publish there, but this did not work. (Physicist 1)

And we also published articles in journals without paying. We always wrote, “we are sorry, we cannot pay for that, but please write to us if you’ll take it anyway.” (Physicist 2)

These various factors combined to create substantially diverse microclimates for international publication. It was forbidden for some researchers, discouraged for others, possible but cumbersome for another group, and for some perfectly normal. In any case, researchers had to be highly motivated and persistent and had to have supportive managers to continuously publish in international journals.

5.2 *Levels of Inclusion*

Table 8.2 provides an overview of patterns in the publication histories of semiconductor physicists and molecular biologists. We categorised researchers as silent members of their communities if they had three or fewer publications, as ignored members if they had more than three publications which together were cited (“seen”) by fewer than ten articles, and as recognised members if their publications were cited by ten or more articles (regardless of the number of their publications).²

Table 8.2 shows that most researchers in our sample were recognised members of their international scientific communities. The table shows that among those whose career ended, researchers who were recognised members of their communities were still a majority. There were no

Table 8.2 Inclusion of semiconductor physicists and molecular biologists from three universities and two Academy institutes in the GDR

<i>State of inclusion</i>	<i>Semiconductor physics</i>		<i>Molecular biology</i>		<i>Total</i>
	<i>Career continued</i>	<i>Career ended</i>	<i>Career continued</i>	<i>Career ended</i>	
Silent	13	7	5	4	29
Ignored	3	5	5	2	15
Recognised	34	13	40	19	106
Total	50	25	50	25	150

²We set these relatively high thresholds because having publications indexed in the WoS and being cited by WoS-indexed publications a few times do not necessarily indicate visibility to the international community. The WoS also includes local and peripheral journals.

interesting differences in the inclusion of researchers from universities and Academy institutes in either field. The only interesting difference between the disciplines is the relatively large proportion of silent community members in semiconductor physics, which is most likely due to contract research for industry, both at universities and at Academy institutes.

Many of the researchers who continued their career could improve their inclusion after unification. Quite often we find noticeable gaps in publication histories during the early 1990s. These were due to voluntary or enforced reorientations of research as well as disruptions of organisational careers.

6 ACHIEVING INCLUSION IN SEMICONDUCTOR PHYSICS AND MOLECULAR BIOLOGY

Despite the overall difficult conditions for researchers in the GDR (5.1), many of them were included as recognised members of their scientific communities (5.2). This section presents some preliminary answers to the question of how this inclusion could be achieved. Our interviews suggest three partial answers: the right topic at the right time, a partial match between a field's epistemic practices and the research conditions in the GDR, and the existence of "inclusion mentors" who actively promoted the inclusion of their younger colleagues.

6.1 *Inclusion in Semiconductor Physics with Original Methods*

Two of our interviewees from semiconductor physics achieved recognised membership because they developed new experimental methods for the preparation of experimental objects or measurements and thus could contribute original data. These methods were only relevant for niche topics addressed by small international communities but were appreciated by them because they led to interesting results. Methodological developments were supported in GDR semiconductor research because the methods were generic and could therefore be used both in work for the GDR's semiconductor industry and for approaching more basic research questions.

Developing new methods was possible even under the difficult material conditions. The impossibility of quickly acquiring advanced equipment was sometimes less important because experimental equipment in many

fields of physics was (and still is) built by the researchers themselves. In some situations, this culture coincided with what researchers in the GDR had to do anyway in order to cope with missing equipment. The self-reliance forced upon the GDR's science had also led to the Academy of Sciences creating the *Zentrum für Wissenschaftlichen Gerätebau* ("Centre for Scientific Equipment Construction"), which in 1984 contributed 37% of all scientific instruments for the Academy of Sciences (with exports from the West contributing only 1%; Gläser and Meske 1996, 189). Sometimes, the development of methods in semiconductor physics was in line with the general trend at the Academy of Sciences of using more staff to compensate for the limited opportunities to buy equipment. Finally, the permanent positions held by most researchers facilitated long-term methods development.

The opportunity to become a recognised member of a community by developing methods is illustrated by the research biography of semiconductor physicist A (Fig. 8.3). After obtaining his PhD at a university, A moved to an Academy institute and was tasked by his head of department with building a new type of device for the analysis of semiconductor materials. This method had recently been developed in the scientific community, and the head of department was keen on using it. He assigned physicist A the task of building the device, which was a typical way to

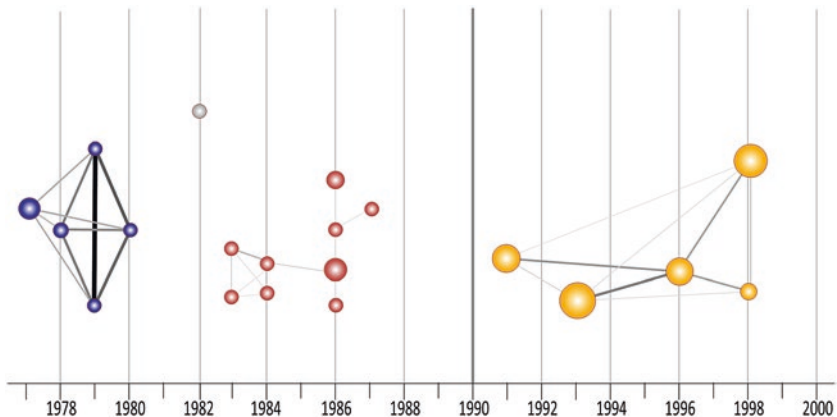


Fig. 8.3 Research trail of physicist A from his first publication indexed in the WoS to 2000

compensate for the GDR's shortage of foreign currency. The project was terminated one year later when a device could be imported. A was then tasked with using the device for routine measurements of a large number of samples from clients in the GDR and abroad. These measurements did not lead to publishable results.

After several years, A changed departments after experiencing conflicts with his supervisors and began a new project centred on developing new techniques for preparing semiconductor samples. His new head of department lacked expertise in semiconductor physics and was occupied with managerial duties, granting A a high degree of independence. A tried out several candidate methods before focusing on one (the second cluster in Fig. 8.3). This method did not work, which is why it was abandoned by his scientific community and by himself. A then transitioned to a managerial position for one year and could not conduct research because he had to spend all his time on administrative tasks.

A then moved to another department in which work on a new class of materials had begun due to an initiative of the divisional head. The materials had become a "hot topic" in the scientific community. A was interested in working with them and began to develop an original preparation method. Although the method ultimately did not work with these materials, it turned out to be applicable to others (the third cluster in Fig. 8.3).

[Method X] did not work. And I spent a lot of time thinking how this could be done better. [...] And I thought of a new procedure for producing these [layers]. What emerged was [method Y], which occupied me, and ultimately haunted me, until retirement.

6.2 *Inclusion in Semiconductor Physics with Original Theory*

The inclusion of theoretical semiconductor physicists was more easily achieved with research that was pure paper-and-pencil theory that did not depend on access to advanced computing technology. Theoretical physicists who did depend on access to computers reported using privately bought desktop computers to become independent from their mainframe computer, which was cumbersome to access, and to abandon topics when the international scientific community moved in a direction that required computing power they had no access to. At the same time, it was easier for theoreticians than for experimentalists to change research topics because computer technology was their only material constraint.

Constraints on international communication can be particularly inhibiting to theoretical physicists, who depend on discussing their work with colleagues (Merz 1997). Being able to meet colleagues who work on similar problems (and thus can appreciate one's contributions) is particularly important in theoretical physics and mathematics because, due to the high specialisation in these theoretical fields, only a few colleagues can actually understand what a researcher is working on (Merz 1997; Heintz 2000: 194–195). Missing opportunities to communicate contributed to one interviewee's decision to abandon his topic.

Then I abandoned this topic. If I stay at home, I can produce the best theory, if I can't talk to the people who apply it or who do similar things ...

Interviewer: To theoreticians or experimentalists?

Both. I can't exchange ideas with them. You don't stand a chance because you stew in your own juices. Sometimes one errs. Or one does things, and it turns out that meanwhile others did it and did it better.

Compared to these two restrictions, political expectations concerning the application-orientation of research played a marginal role. Some theoreticians were expected to collaborate with experimental physicists and to support the interpretation of their data, and in this way might even become tied to the applied experimental research. However, these collaborations never took much time. Thus, some theoretical physicists were free to decide on what to do with all their time, while others had that freedom for most of their time.

Theoretical physicist B began his career with work on a topic that had recently emerged in his scientific community (Fig. 8.4). He had the necessary access to literature but was hindered by his computer facilities because the mainframe computer of the Academy was inconvenient to use. He could partly circumvent this problem by using his privately obtained programmable pocket calculator for some of the calculations.

B collaborated on this topic with experimentalists in his division. His divisional head had contacts with leading Western researchers and presented the work of his division at international conferences, which B was not allowed to attend despite his important contribution to a central topic of his community (the publications at the end of the 1970s in Fig. 8.4). However, his divisional head managed to organise a series of international workshops with B as a member of the programme committee. B also became a member of the programme committee of an international

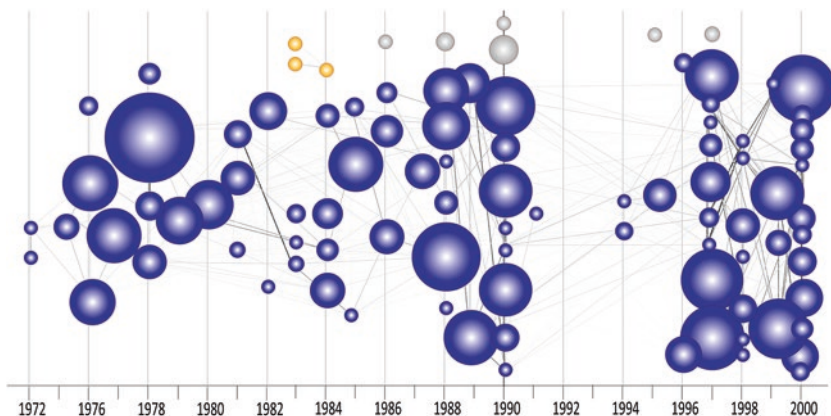


Fig. 8.4 Research trail of physicist B

conference and was able to visit colleagues in a Western European country. At the end of the 1980s, B began to work on a new topic that had emerged in his community.

They moved to thin layers ... and solid-state physics changed a bit in these low dimensions and the physics of three-dimensional bodies becomes a physics of few particles ...

Interviewer: [This] you started already at the end of the 1980s?

Yes. And then we were pleased to be able to contribute a bit because we were able to create concepts early on ...

6.3 *Inclusion in Molecular Biology with Original Objects*

Compared to experimental and theoretical physics, molecular biology was more strongly dependent on the material conditions of research because its methods and the reagents these methods required were developing at a rapid pace. The demand for such reagents was difficult to predict because it sometimes emerged during the research process. Thus, the field's research practices clashed with the scarcity of foreign currency and with the planning system. Consequently, the GDR's molecular biologists should have been unable to match the speed at which the field's "hot topics" developed, but some of them were able to cope:

We called this “trouser pocket imports.” When [M] was allowed to travel to the West, he returned with presents. Or we went to the Leipzig Fair, there was the representative of Boehringer [a company selling reagents]. He always questioned us and invited us for coffee. This made him well informed. He had a fridge at the Fair and asked, “Is there something special I can treat you with?” I answered, “[Reagent X] would be super.” We did not find this humiliating. This was part of the game.

...

And when a trouser pocket import comes—this is valuable. You think a hundred times how you can make the most of it.

The epistemic practices of molecular biology in the 1980s provided opportunities for researchers from the GDR to become included. Molecular-biological methods largely use generic equipment, which arrived at GDR research laboratories with significant delays but could be used for many different research processes once it was there. Molecular-biological methods were also still in an early stage of development, in which they became utilised in an ever-larger number of fields of the biomedical sciences. The many biological objects that could be investigated with molecular-biological methods and the many questions that could be addressed with each object provided ample opportunities to make contributions, even if these were not at the research front.

Molecular-biological methods also provided opportunities to create new research objects, for example, by isolating and describing genes or by producing new proteins with altered genes. This was (and at least in some fields is still today) a process of trial-and-error in which mutant cells were created or proteins produced in large numbers and then screened for biologically interesting properties. Thus, the biomedical sciences faced the opportunity to create innumerable new research objects of potential interest, and finding an interesting one was partly a matter of luck, which often translated into time spent on numerous attempts to create interesting objects. In this situation, the large number of researchers who had permanent contracts (and thus did not need to compete for individual career progression) partly compensated for the difficult material research conditions.

After receiving his PhD at a university, biochemist C moved to an Academy institute, where he joined a department that worked on a topic that was a priority of the scientific community (Fig. 8.5). However, there

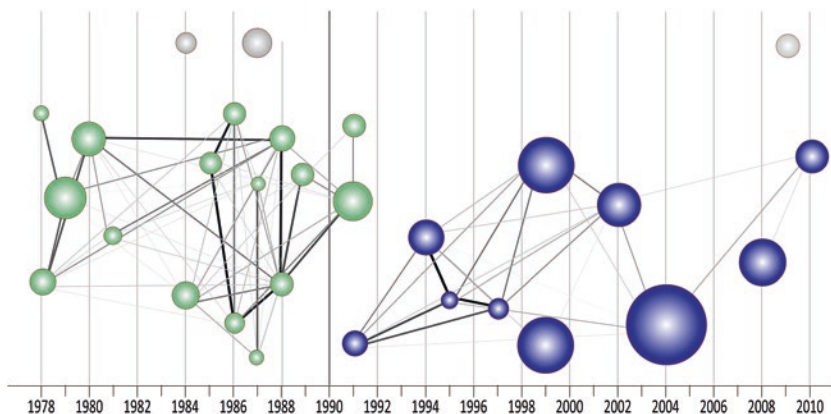


Fig. 8.5 Research trail of molecular biologist C

was no strong competition with Western groups because the head of department had chosen a unique object as model system, which nevertheless enabled the production of relevant scientific contributions.

C's head of department had close relationships with Western colleagues with whom he organised local meetings and engaged in informal scientific exchange. C not only benefitted from these meetings, he also could attend several international conferences of his community. He was even able to participate in one conference in a Western country without having the *Reisekader* status.

C did not encounter serious shortages of equipment or reagents and could use the services of specialised departments for structural analysis like electron microscopy. Reagents brought back informally from trips to Western countries were used economically (see above). In the case of C's research, "trouser pocket imports" were facilitated by his department head's contacts with Western colleagues.

In the late 1980s, the head of department initiated a change of the research questions asked with the model system established in the department, which again met an emerging interest of the scientific community. In the ensuing search for relevant biological objects, C found a new relevant protein that "sustained" his research programme (Fig. 8.5, first publication in 1991).

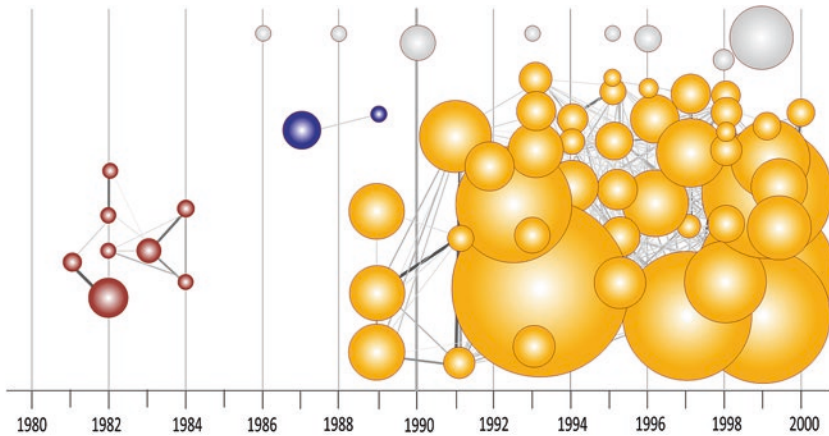


Fig. 8.6 Research trail of molecular biologist D

The research biography of molecular biologist D was quite similar (Fig. 8.6). D joined the Academy institute after completing his PhD at a university and first worked on a project for an industry partner. Although the project leader warned him that he would not be able to earn any scientific merits with this project (its purpose was to catch up with the international state of the art), he was happy with this because he wanted to use the project to broaden his knowledge of biochemical and molecular-biological methods.

Three years later, D had the opportunity to use the methods he had learned in more fundamental research.

This was cloning of DNA, which was very much *en vogue* at the time and which [my institute] wanted to engage in because it was the research front. This began in Western countries in the early 1980s. And [my institute] recognised this in the mid-1980s and said that we also need to establish recombinant DNA technologies and cloning.

D collaborated with many colleagues of other departments, taking advantage of their specialised knowledge and equipment. Establishing the new method was seriously hampered by the lack of biochemicals, a problem that was eventually solved by a trouser pocket import with the help of

a colleague who travelled regularly to Western labs. The new molecular biological research led to the discovery of new proteins. While the discovery occurred in a research context that was considered exotic and outdated by the community, an additional function of one of the proteins could be exploited in a different research context and triggered D's successful long-term research programme (the large cluster beginning with publications in 1989 in Fig. 8.6).

Until German unification, D had little personal contact with colleagues in Western countries. However, he benefitted from his colleagues' regular stays in Western laboratories because they provided knowledge about the research front and supported decisions to establish new methods.

7 PRELIMINARY CONCLUSIONS

This chapter has discussed the ways in which researchers in the GDR became recognised members of their international scientific communities by negotiating the interplay of adverse research conditions in the GDR and field-specific practices of knowledge production. Although our investigation is still ongoing, some conclusions about the inclusion of GDR researchers in their international scientific communities can be drawn. First, the conditions hindering inclusion can be distinguished on two dimensions, namely the source and the target of constraints (Table 8.3). Among the constraints that originated with the GDR, some were intended to constrain researchers. Travel restrictions were intended to limit international contacts and relationships of researchers, probably with the aim to curb Western ideological influence and to limit defections of researchers who travelled to Western countries. These constraints must be distinguished from those that were simply due to scarcity. Archival records showed that the overall scarcity of resources in the GDR was a main theme

Table 8.3 Sources and targets of constraints on the inclusion of East German scientists in their international scientific communities

		<i>Source</i>	
		<i>GDR</i>	<i>External</i>
Targeting GDR's science	Yes	Travel restrictions	Technology embargo
	No	Scarcity of resources for travel, literature, equipment	Publication and conference fees

running through the planning of stays abroad, imports of literature, travel contingents, imports of equipment and reagents, and the distribution of domestically produced resources. The distinction between economically and politically motivated restrictions is not always easy to draw, and it didn't make a difference for the researchers whose inclusion was constrained. However, it is important for an assessment of the impact of the GDR's general political and economic situation on its science.

Not all constraints on the inclusion of East German scientists originated with the GDR. The technology embargo imposed by the United States targeted the technological development of socialist countries and thus also the GDR's science system. The various publication and conference fees, on the other hand, were established on the implicit premise that everyone could afford them, and that they could be waived for those who couldn't. However, they affected the inclusion of researchers who thought they had to pay these fees but could not.

Second, the impact of adverse conditions on inclusion was field-specific because the degree to which constraints affected research processes and the extent to which researchers were able to work around them depended on a field's epistemic practices. Examples of such field-specific conditions include the general practice of physicists constructing their experimental systems themselves, the low susceptibility to material constraints and political pressure of theoretical physics, and the opportunity to locally create research objects that were of interest to the whole community in molecular biology. The variation of conditions between organisations and regions in the GDR and the variation of field-specific epistemic practices made local conditions for the inclusion of GDR researchers in their international communities highly specific to the time and place at which they worked.

Third, international communication had to be actively sought and often depended on superiors and colleagues who already participated in international communication and collaboration networks. These colleagues suggested research topics that were relevant to international scientific communities and introduced their younger colleagues to the international community, made contacts possible, and supported international publication. This was not different from practices of mentoring young researchers elsewhere in the world. However, the number of researchers who could act as inclusion mentors diminished over time in the GDR because each subsequent generation of researchers had worse possibilities to build international contacts.

Our account of successful cases of inclusion does not demonstrate that the material and political constraints under which researchers in the GDR worked were unimportant. These conditions forced many researchers to select research problems they considered less interesting and approaches they considered sub-optimal. They also prevented most researchers from communicating with members of their international communities according to the norms of these communities and according to the necessities of their research processes. However, the cases discussed in this chapter show that some researchers managed to successfully include themselves in their scientific communities because they were able to circumvent these conditions or to compensate for them. Taken together, these findings show that the observation of country-wide or international constraints is not sufficient to justify conclusions about the inclusion of individual researchers working on specific topics in particular fields.

Finally, the analysis of conditions for inclusion and of their impact is applicable beyond the specific case of the GDR. If we look at inclusion as a specific aspect of the knowledge production process in an international scientific community, we need to consider the research problems researchers construct for themselves in their specific situations, as well as their opportunities to address these problems and to communicate findings. While the combination of constraints discussed in this chapter is specific to the GDR, constraints hindering inclusion exist in all countries at least for some researchers. The GDR appears to be an extreme case of constraints to inclusion, which makes it an interesting object of study meriting greater attention in the sociology of science.

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The Question of Legacies: Socialist Elites in Post-Socialist Transformations—East Germany’s Elites from a Comparative Perspective (1990–2020)

Charlotta Cordes, Mareike zum Felde, and Heiko Pleines

I INTRODUCTION

The research on elites in East Germany following the regime change in 1989/90 has evolved over the last three decades. Originally, the literature on post-socialist transformations regarded the continuity of socialist elites as one of the major obstacles to the establishment of democratic and

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market economy institutions. Accordingly, in the early 1990s, this literature presented the special case of the GDR, where elites were replaced on a large scale, as a success (Derlien 2001). However, attention soon shifted to perceived problems in the unification process. Focusing on state governance and social integration, researchers started to examine whether the democratic elite consensus was endangered, how well the East German elite was integrated into German politics and society and to what extent it had converged with its West German counterpart (Bürklin and Rebenstorf 1997; Martens et al. 2012). The assumption of early transformation research, guided by modernisation theory, that this convergence would happen quickly and automatically was strongly criticised. This led to the recognition of the cultural factor, of non-Western potential and of multi-variant, open-ended, own-logical developments (Waschkuhn and Thumfart 1999, 15–18; Kollmorgen 2001). Despite some exceptions (Damskis et al. 1996; Damskis 1997), this mostly did not prevent elite researchers from using the West German situation as the benchmark for assessing the development of East German elites (Maier and Schmitt 2008; Jaeck et al. 2013). More recently, in reaction to critical assessments of the state of democracy in East Germany, the focus of elite research has shifted to the issue of the underrepresentation of East Germans in Germany's national elite (Kollmorgen 2021; Vogel 2017; Vogel 2020).

Overall, today's knowledge about elites in East Germany since 1990 continues to be shaped by the convergence perspective. The aim of this chapter is to broaden the debate on post-socialist elite change. First, we compare the development and characteristics of East Germany's elites not to West Germany but to three Central East European countries that also underwent a post-socialist transformation. Second, we argue that it is fruitful to position the question of experience at the centre of further investigation. We think that quantitative elite research is a good starting point for such an endeavour, as it can suggest promising new questions while revealing some general patterns and trends.

The results presented in this chapter are derived from an original dataset compiled by the authors in collaboration with a larger team. The dataset includes the incumbents in a predefined sample of political elite positions in East Germany, Czechia, Hungary and Poland across seven reference years (based on five-year steps from 1990 to 2020) categorised according to their sociodemographic characteristics (such as age, gender, professional background) and role during socialism (namely, old elite or regime followers, opposition/dissenters, newcomers after socialism).

A member of the old elite is defined as any person who held any leading political position (including at the local level) in the Communist Party (or a “bloc party”) or the state executive during socialism. The status of follower is given to any person who held an ordinary position without any responsibility for personnel or decision-making powers (including active party membership). Opposition/dissenters are those who were visibly opposed to the socialist regime prior to the onset of political regime change.

Based on a positional approach (see, e.g., Hoffmann-Lange 2018), the dataset covers a broad range of institutions, namely, leading positions in the state executive, legislative and judiciary as well as further state institutions, such as audit chambers, mayors of major towns, chief executives of public media, state companies and universities as well as leaders of the major trade unions and business associations. The resulting dataset covers office holders for 2439 position/years and includes 1479 persons (i.e., different office holders). A full description of the data collection has been published as Chorna et al. (2022). The political “practitioners” of the transformation in East Germany covered in our dataset mostly gained their position as a result of state-organised selection processes. Accordingly, our results are only valid for this subpart of post-socialist elites. Moreover, as the dataset includes the holders of specific positions at specific points in time, it does not allow us to reconstruct the life courses of elites. Instead, it provides snapshots of elite composition at seven reference dates ranging from 1990 to 2020.

2 SHIFTING RESEARCH PARADIGMS

Since its inception, post-socialist elite research has largely agreed that in East Germany a comprehensive elite replacement took place during the early years of transformation. The Bamberg publications of the 1990s on post-socialist elite transformations argued that becoming a part of the Federal Republic of Germany (FRG), that is, the former West Germany, made the GDR a special case in terms of elite transformation, as this entailed both a reduced need for local elites and an external reservoir of West German elites. Such studies also highlighted the far-reaching and systematic political lustration (Derlien 2001). The ruling party in the GDR, the Socialist Unity Party of Germany (SED), employed party removal and expulsion procedures from October 1989 onwards. In newly emerging political arenas, reform-oriented socialists and reform activists outside the SED now occupied elite positions (Waschkuhn and Thumfart

1999, 78–79). In 1989/90, enquiry commissions were set up to assess and dismiss political personnel (Krüger 2011, 132–133). The democratic elections in spring 1990 completed the change of party, parliamentary and executive elites, while the elites in the state administration, judiciary, military, economy and societal associations changed only a little later, largely through elite transfer from West Germany (Derlien 2001, 55–64, 74; Martens et al. 2012, 25). The state's personnel policy after October 1990 promoted this development (Böick and Lorke 2022, 49–50; Statista 2021). Thus, from the perspective of revolution and elite theory, which mostly guided empirical studies in the early 1990s, the question of elite reproduction in East Germany could be ignored. The only exceptions to this were a few studies on the survival of the former upper service class (Solga 1996). While the thesis that former socialist cadres quickly returned to power is still virulent among the German public today (Knabe 2021), in academic research, the question of socialist elite reproduction had already been settled by the mid-1990s.

In the wake of worsening social transformation crises in Germany, however, the issue of elite reproduction became a relevant question from the perspective of democratic theory. In the large Potsdam study on German elites in 1995, Wilhelm Bürklin and his research team examined elite consensus, in line with the West German tradition of the Mannheim studies. They placed the question of the integration of the East German elite into a coherent national elite at the centre of their investigation (Bürklin 1997, 11–13). They examined whether recruitment, self-images and political attitudes, as well as value orientations, differed between East and West German elites. A substudy then explored to what extent the same group characteristics remained advantageous for upwards mobility before and after 1989 (Welzel 1997). The result was that not only elite composition but also recruitment patterns had changed fundamentally. However, in comparison to their Western counterparts, as another substudy showed, the East German elite's members cultivated a more interventionist concept of state and a more concordance-democratic (as opposed to competitive) style of leadership (Machatzke 1997). The author simply stated that these political ideas of the East German elite members emerged from their “socialization in the socialist-planned economy culture” (Machatzke 1997, 349). In a later article, two other project members elaborated further on the question of socialisation and political world view, but their study nevertheless remained at a rather generalising level (Kaina and Sauer 1999, 98–103). However, the basic finding of the Potsdam studies with

regard to the supposed danger to elite consensus was that the new domestic East German elites were almost entirely composed of people who had supported the democratisation of the GDR. This research emphasised that their political concepts meant anything but a categorical rejection of West Germany. Their concepts suggested only gradual changes in the West German model, concerning, for example, the intensification of democratic mechanisms and the limits of neoliberal policies (Welzel 1997, 236–237).

The last major research project on regional elite transformation after 1989/90 in Germany, “Delegation Elites after the Upheaval”, ran from 2001 to 2012 at the University of Jena within the framework of the Collaborative Research Centre “Social Developments after System Change”. It dealt with the question of the recruitment patterns, career paths and political orientations of parliamentarians at the national and regional levels—first of all, in an intra-German comparison. Their major finding was that a convergence from East to West had occurred (Martens et al. 2012). Only in reaction to the widespread thesis of delayed elite reproduction in some East Central European countries did a member of the project address the topic of elite reproduction since the 1990s (Edinger 2004). Using a very broad concept of socialist elite, the Jena researchers arrived at an initial reproduction rate of 25% (Edinger 2004, see p. 89). Based on this empirical evidence, one cannot talk about comprehensive elite replacement. It is important to note, however, that the concept of elite reproduction had implicitly changed. It had shifted away from the personal and structural reproduction of the high- and mid-level socialist elite. Now, the main question was whether the East German elite members had been attached to the SED regime via a former position.

A major objection to the Jena study could concern its external validity, that is, representativeness; in this study, the analysis had been limited to a sample of regional parliamentarians. As members of the representational elite, they were less affected by elite transfer from West Germany because of their representative and legitimising function (Derlien 2001, pp. 65–70). However, our broader elite dataset, where East German parliamentary deputies comprise a share of less than a third, confirms this finding. In our dataset, former regime elites and followers, that is, “regime supporters”, account for 27% of all surveyed position holders in 1990 and 14% of the whole sample from 1990 to 2020. The limits of elite replacement become even more visible if elite transfer from West Germany is excluded from the dataset. Among those elite members who had been living in the GDR before 1989, the proportion of former “supporters of the socialist regime”

amounts to 35% for 1990 and to 21% for the whole period from 1990 to 2020. Our dataset also shows that for East Germany, this is a debate about the past. In the reference year 2020, only 4% of elite positions were held by people who could be described as former supporters of the socialist regime.

A comparison to East Central European states shows some variation but does not present East Germany as an outlier, as Table 9.1 demonstrates. However, in Hungary and Poland, in contrast to East Germany and Czechia, approximately half of the former supporters of the socialist regime had previously held top positions (and not just minor ones). By 2020, East Germany and Poland had the lowest share of former supporters of socialist regimes among their political elites, as covered in our dataset.

Thus, concerning elite continuity, in the post-socialist context of Eastern Central Europe, East Germany was not a special case in quantitative terms. This may reflect how in East Germany in the 1990s, the influence of the Stasi, the GDR's state security service, was perceived to have been overwhelming. As a result, informal cooperation with the Stasi, the much-discussed work as an informal member (abbreviated as IM), was sufficient for political exclusion, while "normal functionaries" largely managed to avoid the focus of public interest (Krüger 2011, 134). However, to understand the relevance of former supporters of the socialist regime in East Germany after 1989, it is important to examine their actual positions and, thus, the decision-making power they acquired after 1989 and the role they had played in the GDR.

Among the "socialist regime supporters" identified in our East German sample for the full period from 1990 to 2020, only a minority ever acquired a position in the state executive after the end of the socialist regime. Only 26% of them were members of one of the five regional governments in one of the reference years, thus accounting for only 10% of all selected ministerial positions. The absolute majority of "socialist regime supporters" (79%)

Table 9.1 Share of "former supporters of the socialist regime" among elites

	<i>GDR—full sample</i>	<i>GDR—only East Germans</i>	<i>Czechia</i>	<i>Hungary</i>	<i>Poland</i>
1990 (1993)	27%	35%	22%	23%	39%
1990–2020	14%	22%	16%	26%	16%
2020	4%	7%	18%	10%	4%

Note: for Czechia, the first reference year is 1993

were active as part of the representation elite, with 48% holding a position in one of the five regional parliaments as a committee or faction chair and 21% heading a political party represented in parliament. Only from 2010 onwards did a “former socialist regime supporter” become mayor of a major city, a trade union district chairperson or the CEO of a major state-owned company, as covered in our sample. It can thus be concluded that although former “socialist regime supporters” have been present among the East German elites, their numbers have been too small and the positions they have held too dispersed (across regions, institutions and time) to allow them any joint influence on political decision-making. This assessment comes with a qualification regarding the very early phase of transformation. In 1990, former “socialist regime supporters” still held 24% of all ministerial posts, but this number was already reduced to 9% in 1995 and has been gradually decreasing since. This pattern of a sharp decrease in the share of “former supporters of the socialist regime” during the first half of the 1990s and a slow decline afterwards also represents the overall picture as covered in our dataset.

While lustration in the GDR did not reduce the share of former supporters of the socialist regime to an extraordinary degree, it clearly impacted their distribution among institutions. While in post-socialist East Germany, only a quarter of them ever joined the state executive, nearly 80% held a position in a political party and parliament at some point in time, if we look at the whole period under study. In contrast, in Czechia, slightly more than half entered the state executive, and only a third ever joined the legislature, while very few occupied elite positions outside government and parliament. In Hungary, the distribution of former supporters of the socialist regime is the most diverse: 13% are in leading positions in academia, mostly as rectors of the largest universities. Slightly smaller numbers gained positions at state-owned companies and trade unions. Former supporters of the socialist regime were also, in different reference years, the head of a public TV station or the national bank. Again, in the case of Hungary, the share of those joining the state executive (37%) is higher than the share of those in the legislature and party system (23%). In Poland, the picture is also diverse, with supporters of the old regime present among the judiciary, mayors, trade unions and business associations. Approximately half have joined the state executive in at least one reference year and a quarter political party leadership and parliament.

The thesis that first of all, “second rank professionals” (Andorka 1993) or “deputy heads of departments” (von Beyme 1993) of the socialist

regime managed to join the post-socialist elite is only partly valid for East Germany. Stefan Hornbostel, who calls this group “survivors”, argues that the political purge in the top positions ensured that the chances for mid-level leaders at the regional and local levels to continue their career paths were comparatively good (Hornbostel 2000, 132–133). Our data lead to a more differentiated picture. Most importantly, the majority of former supporters of the socialist regime in our dataset who gained a position were merely “followers of the old regime” (75%). That is, they did not have any personal leadership responsibility in their previous function in the GDR. Moreover, only 18% were employed at the national level. The absolute majority of former supporters of the socialist regime in our dataset (60%) had only been politically active at the local level. Additionally, approximately half of them had been members of a bloc party (46%), not of the Socialist Unity Party (SED). These are important differences, as recent historical research has shown. Functionaries from nearly all levels and sectors, especially in the economy and the planning apparatus, did not just follow the guidelines from above. They had a scope for action and had to be able to react, relatively flexibly, to problems (Hübner 1999, see. 26–28). The bloc parties certainly pursued their own interests within the system (Triebel 2019). Local party and state functionaries of the SED acted mostly as paternalistic caretakers and crisis managers on the ground (Bahr 2015; Ganzenmüller and Triebel 2022).

These findings turn less attention to the simple question of whether elite members had been active at all in the socialist political system but more to their specific socialist experiences and their lasting impacts during the 1990s. This legacy has often been perceived as a nearly self-explaining factor. The automatic attribution of mentalities, qualifications or attitudes to a homogeneous schematic GDR socialisation ignores the trajectory of individual former regime supporters in GDR society and its processing in their mindset. Concerning their potential “socialist legacy”, it is also important to note that two-thirds of the “former supporters of the socialist regime” were below the age of 40 in 1989. Thus, many had not been long employed in socialist institutions. Moreover, a third of them had not simply “survived” the end of the regime but had become heavily involved in the democratic reform processes and institutions that Thomas Großbölting has called “schools of democracy” (Großbölting 2020, 309–310).

This broader approach to a “socialist legacy” also works in reverse. Socialisation in the GDR influenced those who did not assume any

position in the regime, either because they remained passive or because they were too young at the time. Such re-perspectivisation thus sheds light on all East Germans—not only the “survivors” but also the “newcomers” (Hornbostel 2000). This also requires an assessment not only of their experience in the GDR but also of their engagement during the period of protest, reform and regime change.

3 ELITES SOCIALISED UNDER SOCIALISM

To present a broad picture of the possible impact of the socialist past on East German elites during the three decades after regime change, we look at key features related to their political socialisation, again in comparison with the elites in three formerly socialist Central East European states. Accordingly, the figures in this part, unless indicated otherwise, do not refer to the whole elite of East Germany in our dataset but only to those who were socialised in the GDR. We start with an exploration of political affiliation and system-specific knowledge and then examine generational difference as well as the gender dimension and the role of professional background, including academic education.

3.1 *System-Specific Knowledge and Party Affiliation*

In the GDR, support for the political system was a requirement for any elite position. Moreover, many elite positions were available only after training that provided knowledge specific to the ideology and governance of the socialist regime. Thus, membership in one of the parties of the National Front, that is, the SED or one of the bloc parties, was a necessary prerequisite for any political elite position. For promotion in the state hierarchy and appointment to a higher leadership position, the nomenclature system required attendance at party trainings and educational institutions in addition to SED party membership (Wagner 1999, 53–56; Welsh 1999). A government position required the conclusion of political-ideological training tailored to the GDR’s ideology as well as the system of planning and management.

After 1989, such training was not only devalued but even became an obstacle for promotion to any elite position. Similarly, professional training and work experience in the state administration, judiciary, and, to a large degree, company management gained in the GDR were no longer relevant qualifications after 1990. As a result, university graduates from

the natural sciences and engineering dominated among the East German elite members in the 1990s (Welzel 1997, see p. 208–209). This was in stark contrast to West Germany, where degrees in political science and economics were most common among elite members (Martens et al. 2012, 29).

The situation was more complex in the case of party membership. Following the introduction of West Germany's party-based competitive democracy, after 1990, party membership was, *de facto*, still needed for joining parliament and an important aspect for appointment in the state executive and beyond. Accordingly, our dataset shows that in 1990, almost all East Germans in elevated regional elite positions, concentrated in the legislature and to a lesser degree the state executive, were members of a nationwide political party. The parties of the GDR in 1989/90 had almost all merged with their West German nominal counterparts (Neugebauer 2002). While in the GDR, party membership was a prerequisite for any leading position in the regime, after 1990, it lost relevance in the judiciary, public media, state companies or academia. In summary, for those elite positions that were generally available to East Germans with a prior career in the GDR, membership in an all-German political party was very important.

The party affiliation of members of the post-socialist elite in Poland exhibits more variation. In contrast to East Germany, approximately 39% of Poland's political elite in our sample for 1990 do not belong to any political camp. Even 13% of the people in the sample for 1990 with an active role in socialism, as supporters or oppositionists, did not join any party. The general share of people without political affiliation increases to 48% in 2010 and remains at a comparatively high level, 43%, in 2020. Elite members without political affiliation hold a variety of positions: mayors, CEOs of state-controlled companies, the president of the supreme court, heads of business clubs and trade unions (incl. *Solidarność*) as well as university rectors. Most importantly, in every government covered in the sample, several ministers do not belong to any party.

These findings might be explained by the reduced importance of party membership in Polish socialism for elite recruitment (Wasilewski and Wnuk-Lipiński 1995, 683) as well as the high volatility of the party system and low esteem of parties in society, especially after the transformation (for a general description of [early] Central East European post-socialist party systems, see Enyedi 2009). As Raciborski (2007, 38) adds, recruitment for government positions is a rather open process and is

not limited to candidates from the political sphere. These factors may entail that party membership is of much less importance in Poland than in unified Germany.

Similar to party membership during socialism, training and academic education received in the Polish People's Republic do not seem to be criteria for exclusion from elite positions. Throughout the whole period under study, there are a rather stable proportion of engineers and architects (approximately 12%), lawyers (approximately 15%) and life, physical and social scientists (approximately 22%). The shares of professions in business and finance decreased from 18% in 1990 to 11% in 2010. In a study by Wasilewski (2000, 198) concerning the elites in 1998 with a focus on their academic degrees, the author finds that a share of 32% of the political elite had graduated in the humanities, social or natural sciences. For the administrative elite, this value decreases to 20%, but the share of lawyers increases from 22% to 34%. The share of lawyers, social scientists and humanities scholars exceeds the share of engineers by approximately a third. These findings support the conclusion of our study that an education received during socialism, even in fields such as law, social sciences and humanities, did not function as an obstacle to becoming a member of the post-socialist elite in Poland.

Concerning the role of supporters of the opposition to socialism, there is again a stark contrast between East Germany and Poland. The new East German elite after 1990 hardly included any members of an oppositional counterelite or dissidents who had challenged the socialist regime. In our dataset, for East German regions, their share stands at a mere 5% for the entire period from 1990 to 2020 and at approximately 10% for the 1990s. These results contrast with the findings of the Potsdam Elite Studies, which count 24% of former opposition members among East Germans in the German national elite (Welzel 1997, 219). This difference can be explained by the fact that the Potsdam Study also includes high-level positions in culture, church and civil society organisations, which our dataset of political elites does not cover. Moreover, in the former, opposition to the socialist regime is identified via self-evaluation and only assessed in terms of coherence with the broader political stance, while our dataset evaluates “visible opposition” during socialist times. Moreover, our findings are in line with those historical studies that argue that civil rights activists in the GDR lost their influence swiftly in the course of events during 1989/90. (Großbölting 2020, 296–301; Eckert 2021, 273–274, 277–279.)

This means that the majority of the East German elite after 1990 had neither been “supporters” nor been “visible opponents” during socialist times. In Poland, however, visible supporters of the opposition to socialism comprise a third of the full country sample of our dataset and in Hungary 28%. This means in both countries, the post-socialist elites in our dataset comprise more opponents of the former socialist regime than supporters. For Czechia, however, the figure of opposition representatives is closer to that in East Germany, 8%. These differences can be traced to the history of dissent in their respective socialist state and to the role of their representatives in regime change (Dietrich 2002).

For the East German case after 1990, the group of “transition politicians” who were politically and actively involved during 1989/90 was especially relevant. Directly after 1990, they made up 60% of the parliamentarians in East Germany (Martens et al. 2012, 36–37). According to our dataset, the active promoters of political reform in 1989/90 even accounted for 71% of East German elites in 1990. Their share declined, but only slowly, standing at 64% in 1995 and 57% in 2000, then dropping below 25% in 2020—a development that is largely due to the long time span since 1990 and the resulting retirements. Regarding transition politicians in East Germany, it is indicative that according to our dataset, 39% of all transition politicians became involved in politically institutionalised contexts for the first time in 1989/90. They thus had their first politicisation experiences during the period of regime change. Moreover, 1989/90 was a (re)learning phase for numerous previous regime supporters, who joined protests, democratic grassroots movements and newly democratic institutions.

Whether and to what extent the political culture of East German elites, their self-images and their political concepts were shaped by this experience requires further investigation. However, it should be noted that large parts of the East German elite had political experience not only, if at all, in the socialist regime but also during the regime change in 1989/90, when the socialist top elite was forced to resign.

3.2 *Age*

The top elites in the GDR, as in the other socialist states in Central and Eastern Europe, usually only retired for health reasons and, as a result, stayed in office far into old age. In the late 1980s, the average age of the GDR’s elite members was over 60 years (Welzel 1997, 208). Accordingly,

the GDR's top leadership mainly consisted of so-called old communists, who had high prestige because of their experience with resistance and repression under National Socialism. The next ranks in the hierarchy were occupied by younger functionaries, the so-called Hitler Youth generation born between 1925 and 1935. They had experienced national and ideological decline after 1945 as well as both deprivation and the possibility for social mobility during the socialist build-up phase (Epstein 2003). The elite transformation in East Germany that began in the autumn of 1989 brought with it the end of their political careers.

The 1989/90 break thus meant that the elite in East Germany as a whole became younger and that members of new generations joined it. In our dataset, for the full period from 1990 to 2020, the vast majority (approx. 85%) of the new East German elite was born after 1942. They were all educated in the GDR but had only started their careers—if at all—in the reform phase of the 1960s or during the late socialism of the 1970s and 1980s. For the older ones, advancement to a higher elite position in the GDR had hardly been possible because their upward mobility had been blocked by older incumbents (Welzel 1997, 203–204). The generational change in 1989/90 was much more abrupt than any age-related biological replacement process. In 1990, 25% of the East German elites and 22% of the whole sample for Eastern Germany, including those not born in the GDR, were between 30 and 40 years of age. At that time, 60% of these East Germans had been born after 1942.

The intensity of the generational change in East Germany was not exceptional in regard to post-socialist transformations in 1989/90. In 1990, a quarter of the East Germans covered in our elite dataset were not older than 40 years. The same figure stands at 22% for Hungary, 14% for Poland and 25% for Czechia (with the reference year 1993). In later years, the share of those who were too young for a full professional career in socialist times, that is, newcomers, increased more for East Germany than for Central East European countries. In the full country sample covering the period from 1990 to 2020, approximately 37% of the elites in East Germany were not older than 30 years in 1989. The same figure stands at a third in Czechia and at approximately 20% in Hungary and Poland.

3.3 *Gender*

In the GDR, formal equality and measures to promote women had consequences for women's self-image and recognition. However, the issue of

gender emancipation was primarily linked to the recruitment of female labour. Little changed in the traditional notion of two, binary gender characters or in the accompanying gender-specific division of labour inside and outside private space (Harsch 2015). Nevertheless, the socialist postulate of equality had an impact on the composition of parliament. While women comprised 15% of the lower house in the West German parliament, the Bundestag, from 1987 to 1990, their share in the East German Volkskammer in 1986 stood at 32% (Feldkamp and Sommer 2003; Patzelt 2002, 393). The elections to the Volkskammer in spring 1990 initially led to an adjustment to West German conditions, with the share of women falling to 20% (Tüffers 2016, 66). The first all-German Bundestag election later in the same year resulted in a similar gender distribution (Feldkamp and Sommer 2003).

However, outside parliament, the GDR elite was strongly male-dominated, with women accounting for a mere 5% (Welzel 1997, 208). The regime change in 1989/90 did not lead to a strong adjustment in the gender balance among elites. In our dataset, the share of women in the elite of East Germany stands at slightly over 10% in 1990. Compared to the GDR's nomenklatura, the proportion of women in regional elite positions had thus risen slightly overall, but it had fallen in regional parliaments. There was no positive effect of elite transfer from West Germany on female representation. The women who were now in higher positions in East Germany had almost all grown up in the GDR. Because of the marginalisation of gender in transformation research, the role of women as agents of change and the transformation of the hegemonic masculinities and structures promoting them from patriarchal socialism to capitalism remain largely neglected in academic research (Bock 2019). The concept of co-transformation (Ther 2018), thus far applied mainly to economic policy phenomena, could lend itself to an examination of the mutual relationship of change in East and West. How far the imported Western democratic and economic model perpetuated or changed, exacerbated or improved the structural and ideological sexism of state socialism is still open for investigation (Bock 2019).

Our dataset shows that especially in comparison to the other Central East European countries, East Germany has seen a substantial increase in the proportion of women among political elites. In our broad sample of political elites, the share of women rose above 20% in 1995—again, not as a result of elite transfer from West Germany. Increasing gradually, it reached 32% in 2020. By 1995, when the share of women had risen slightly

above 20% in East Germany, the respective figure was 8% for Hungary and 5% for Poland. By 2020, when the share of women among the East German elites amounted to a third, in Czechia and Poland, it stood at approximately 15%, while in Hungary, the share of women in our elite sample reached 10% for the first time.

In East Germany, the comparatively strong increase in the share of women among political elites was part of a national development, namely, the introduction of quotas for women in several parties and the Women's Advancement Act of 1994 (Schnapp 1997, 95). However, given that the social crisis after the regime change affected women in East Germany the hardest (Hoffmann 2020, 29), their entry into politics, rather than an increased share of women as part of the elite transfer from West Germany, requires an additional explanation. It can be hypothesised that socialisation prepared the ground for a woman in the GDR to participate in the new political institutions introduced by the West German model. This is supported by our data, which show that women in the East German elite were overrepresented among those who had officially participated politically in GDR society (32%) and who had been involved in the transition (22%). Hence, a question arises for future research: whether and to what extent the presence of more women in leading positions in East Germany in the 1990s changed the political culture in specific institutions or sexist dynamics during the transformation process or vice versa.

Female representation in the Polish economic and political elite followed similar patterns as in the GDR, although with lower shares of women throughout the researched period. In the last legislative period in the People's Republic (1980–1985), 23% of MPs were female (Fuszara 2019, 690), while women were underrepresented to an even higher degree in executive bodies (Wasilewski and Betkiewicz 2014, 86). In the direct aftermath of the transformation, Fuszara (2019, 691) observes a “consent for masculinization” regarding political representation, which matches our identification of only two women (heads of parliamentary committees) in our whole elite sample for Poland in 1990. Some possible explanations for the strong decline in women's participation in politics at that point in time are preserved conservative gender stereotypes, a lack of feminist activism, a turn away from the superficial engagement of women in socialist parliaments, new election schemes and the internal recruitment structures of political parties (Galligan and Clavero 2008, 151–154).

Voluntary quotas from governing parties and a binding quota for men and women of 35% as candidates in proportional elections led to a strong

increase in female representation after 2000 and 2011, respectively (Gwiazda 2015, 683–689). These rates reached 24% for the parliament and 32% for executive bodies in 2015 (Musiał-Karg and Lesiewicz 2016, see p. 33–35) and thus reached a considerably higher value than the share of women in our whole sample for Poland (16% for 2015). Throughout the whole period from 1990 to 2020, at least half of the women in the Polish political elites held positions in parliament and government; in 2020, this share even cumulated to two-thirds. Studies on Polish elites from the 1990s exhibit higher values for female representation than in our dataset, most likely because they based their results on far larger samples extending beyond the leading positions in the political sector including larger parts of the administrative and private business sectors. Wasilewski finds a share of 12% of women in 1993 (Wasilewski and Wnuk-Lipiński 1995, see p. 680) and 1998 (Wasilewski 2000, 198), while our sample shows respective values of 6% in 1995 and 3% in 2000. In any case, all these values point to rather low shares of women among elites, while our study underlines the extremely low representation of women across highly ranked positions.

How can this situation for Polish elites, also in contrast to the GDR, possibly be explained? Similar to female representation in political institutions, the initial conditions for women's participation in elites outside the public sector were lower in socialist Poland than in the GDR, with the labour market participation of women in the People's Republic of Poland reaching only 68% in 1985, while the value for the GDR was 88% (ILO and INSTRAW 1985, 137). Additionally, though similar to East Germany, a cut in childcare provisions, the retrenchment of the welfare state in Poland that caused more job losses for women than men and the ongoing and legal practice of filling certain vacancies exclusively with men increased unemployment among women more strongly than among their male counterparts (Kleinmann 2022, 267; Matysiak and Steinmetz 2008, 332; Watson 1993, 475). Furthermore, the sociocultural context and the strong influence of the Catholic Church produced stereotypes that increased the probability of women giving up a job to focus on caring work for their children (Matysiak and Steinmetz 2006, 13–15; for images of women in the Catholic Church, see, e.g., Stegmann 2005). These factors may have led to fewer women being present during selection processes as potential candidates and may have influenced recruiters' decisions when filling a post.

3.4 *Academic Education*

The GDR elite was marked by a very high degree of members with a university degree, especially in the political administration. In the central and regional state organs and ministries, this proportion was approximately between 80 and 95% (Hornbostel 1999, 194–195). The share of Central Committee members with university degrees stood at 91% in 1986 (Schneider 1994, 81). These findings point to system-specific knowledge, since the degrees issued by universities of the socialist party were widespread among elite members. Nevertheless, regime change did not have a strong impact on the share of political elite members with a university degree. The Potsdam elite study gives a share of almost 80% for elite members after 1990 with an academic education (Welzel 1997, 208–123). Our dataset shows very similar figures, with over 75% of East German elite members in 1990 and 1995 holding a formal academic degree. The academic disciplines in which these degrees were earned by East Germans were—as explained above—mostly, supposedly, ideology-neutral. Accordingly, approximately one-third of the East German elite members from 1990 to 2000 were engineers. In our dataset, however, another field of education also stands out strongly: 30% had received training in the field of “Care, Education and Social/Community”. In addition to the technocratic concept of politics among East German elite members, which is often associated in the literature with education in STEM subjects but rarely empirically verified (Martens et al. 2012, 48–49), the influence of fields related to care and education thus suggests itself.

A comparison to Eastern Central Europe demonstrates that the dominance of engineers and of people with training in “Care, Education and Social/Community” makes the East German case exceptional. In our elite samples, engineers account for approximately 15% in Czechia and Poland and slightly less than 20% in Hungary. For “Care, Education and Social/Community”, the numbers are even lower, in the extreme, accounting for only 8% in Poland. Instead, in Eastern Central European countries, people with a business or legal background, that is, qualifications that had been devalued in East Germany if gained during socialist times, are strongly represented among the elites, with a combined share of 42% in Czechia, 41% in Hungary and 36% in Poland.

4 ELITE TRANSFER AND WEST GERMAN SOCIALISATION

Together with formal institutions, many elite members were also transferred from West to East Germany. This was because systemic knowledge was seen as an advantage for building these new institutions. Thus, elites trained in West Germany became an important part of East Germany's elites (Kowalczyk 2019, 170–176; Böick and Lorke 2022, 47–48). Originally, this was expected to smooth the transformation process, leading to swift acculturation. Regarding the impact of meritocratic selection processes, it was assumed that the representation of East Germans in the regional elites would quasi-automatically increase with a new generation (Solga 1996, 105; Kollmorgen 2021, 231). However, it was soon evident that these assumptions were not correct (Kollmorgen 2001). In empirical terms, our dataset shows that the share of people with migration biographies from West Germany among East Germany's elite actually increased by a third from 1990 to 2010. Reacting to the perceived democratic scepticism and elite rejection among the East German population linked to the experience of external domination, the permanent underrepresentation of East Germans among both regional and national elites has become a novel research topic (Böick and Lorke 2022, 48; Kollmorgen 2021; Vogel 2020).

Elite researcher Raj Kollmorgen has identified a threefold pattern concerning the relevance of elite transfer from West Germany since 1990 (Kollmorgen 2021, 236–238). First, the higher positions are, the less likely they are to be occupied by East Germans. This is true except for some fields in the state policy sector (regional governments and parties represented in the national parliament). Second, the chances for East Germans increase in the case of recruitment via democratic election and, third, decrease in the case of an institutionalised career structure or if the ownership of capital is a precondition, with the latter not being relevant for the political elites covered in our study. This leads to a higher representation of East Germans in parliaments and political parties and a lower representation in the state executive, judiciary, business and mass media. Our data confirm these patterns. They also show that there has been no reversal over time. Rather, of the 55 ministerial positions included in our dataset, 34 were occupied by East Germans in 1995 and only 28 in 2020. Our dataset also provides information about further spheres. In academia, East Germans headed some of the largest universities after 1990. However, this was no longer the case after 2005. The East German branches of major business associations and trade unions have mostly been led by West

Germans since 1990. Only in the mid-2010s did an East German become head of an East German trade union branch (in the DGB-district Saxony).

While the East Germans among the regional elites have been studied more intensively, the research on the West German members of East Germany's elites has focused on their numbers and the positions they have obtained, not on their characteristics. Historians who reflect on the historicisation of post-socialist transformations have suggested examining the asymmetrical network of relations between East and West at their locations of encounter (Bösch 2015; Großbölting and Lorke 2017). Recently, there have been an increasing number of historical studies on specific political institutions in East Germany, which also take the Western actors in transformations and their socio-structural positions, motives and cultural concepts of interpretation into account. For example, Markus Böick's (2018) study of the *Treuhand*, the state privatisation agency in East Germany, shows that while the majority of its staff tended to be East German, female and trained in institutions of the GDR's planned economy, its leadership positions were dominated by male industrial managers, administrative experts and junior staff from the West. According to both their own and others' perceptions, a Western frontier idea played an essential role, whereby they understood the capitalist transformation of the East as a patriotic task, a personal challenge and an ideological mission. According to their self-image, they were decision- as well as solution-oriented practitioners of economic transformation, "strong male doers" (Böick 2018, 96). However, these results are clearly case specific. Accordingly, Böick and Lorke (2022, 48–52) cite curiosity, financial improvement, biographical-emotional attachment and pure careerism as some possible further motivations for West Germans to be actors in this administrative transformation.

These historical case studies are essential for understanding the experiences of both East German and West German elite members in East Germany and for examining them as interpretive and narrative actors in their interactions and exchanges (Böick 2018, 79). In this context our dataset adds information about the broader characteristics of the West Germans among East Germany's elites. From our dataset, it emerges that they were not a homogeneous group, except for their dominant, culturally white-German background. It also becomes clear that the average West German in East Germany's elite was markedly different from the prototypical "East German": he tended to be old, male and to possess specifically West German systemic knowledge. For example, West German

position holders were on average 55 years old in 1995. Over the entire period surveyed, they were approximately 90% male. The majority of the West German members of the elite were educated in Western, system-specific fields: approximately 37% of them were trained lawyers, followed by those trained in the field of “business/economics” (approx. 15%). The third largest group (12%) was academics—mainly with a degree in political science. Their age and education could indicate that their understanding of state and society as well as their political ideas was already firmly established when they moved to East Germany.

Based on these characteristics, the West German elite members in East Germany were not representative of the West German population or elite, which raises the question of whether East or West German socialisation and experiences per se might have played less of a role than other social categories in forming the political elite in East Germany. Our dataset generally confirms the picture of West Germans among East Germany’s elites presented in academic research thus far. However, it also provides some evidence showing that the assumption that most West Germans either no longer or never had political career opportunities in the West (Rödger 2009, 347; Eckert 2021, 276–277) is not correct. Apart from the well-known exceptions of Prime Minister of Saxony Kurt Biedenkopf and Prime Minister of Thuringia Bernd Vogel, only one further member of West Germany’s aged, ex-top elite could be found in our dataset; a large group of West Germans instead came from local politics. In line with the recruitment and career patterns of Germany’s major political parties, joining East Germany’s political elite was, most likely, a rather ordinary career step.

5 RESULTS AND FURTHER QUESTIONS

Overall, our findings show that a more differentiated picture of experiences in GDR society is needed to understand the East German practitioners of transformation. Their high degree of academisation, for example, might indicate a great ability to learn and adjust. The development of women’s political participation could be partly an after-effect of the GDR’s postulate of equality. Generational change makes it necessary to ask about social and biographical experiences during late socialism and the reform phase of 1989/90. The political experiences of many members of the new East German elite, both in the GDR and in 1989/90, do not so much point to their obedience to authority and loyalty as to their improvisation, search for innovation, democratic ideals and spirit of resistance.

Moreover, including elite change in other post-socialist countries in an analysis offers relevant avenues for comparison. For example, such a comparison demonstrates that the low share of supporters of the former socialist regime among East German elites is not extraordinary but rather similar to figures for Czechia, Hungary or Poland. At the same time, although a majority of East German elite members joined prodemocracy movements and activities in 1989/90, the East German elite lacked representatives from oppositional movements in socialist times. Therefore, one might argue that at least in terms of state governance, elite transfer from West Germany was the functional equivalent of the opposition to socialism that dominated the state executive in some Central East European countries in the early phase of transformation.

The prominent role of elite transfer makes the East German case unique among post-socialist transformations. As has been shown, it is not useful to draw a simple East-West dichotomy. Further qualitative research should examine elite recruitment and elite interaction in more detail with a focus on social positions, motivations and self-images. Were most West Germans too prejudiced against East Germans to recognise their qualifications (Kowalczyk 2019, 176)? Were they animated by a market euphoria, since their knowledge can be located in the neoliberal discourses of the 1980s and 1990s (Holzhauser 2019)? Or, were many of them simply not flexible enough (Böick and Lorke 2022, 48–52), too fixated on familiar Western structures, following only their own private or institutional interests, thereby preventing institutional innovation (Dietl 2022)? To answer these questions, it is also worth examining the changing political ideas and concepts of transformation. There was diversity among West German institutions and practices at the regional level. Thus, institutional transfer included different options and possible adjustments to specific contexts (Reulen 2004). Moreover, the idea of what constitutes the ideal “West” was anything but undisputed among West German elite members. In addition, it is important to note that while they may have occupied more powerful positions on average, they were not the only ones with agency during East Germany’s transformation and in regional politics (Müller 2017; Großbölting and Lorke 2017).

While East Germany’s regional elites are, in many aspects of their social profiles, very similar to the national elites in Eastern Central Europe, we have identified two strong differences. The share of women among elites is comparatively high in East Germany, and only in East Germany are professions related to care, education and social/community represented

strongly among elite members. Both features potentially point to important aspects of elite recruitment and its societal context. At this point, quantitative research has obviously reached its limits.

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The Re-allocation of Entrepreneurial Talent During Transition from Socialism to Market Economy: Some Conceptual Thoughts

Alina Sorgner and Michael Wyrwich

I INTRODUCTION

One of the most fascinating findings over the course of economic transition from communism to market economy was the massive surge in start-up activity across Eastern Europe (e.g., Smallbone and Welter 2001; Fritsch et al. 2022). Where did all these new entrepreneurs come from?

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Self-employment was prohibited in socialist planned economies, hardly allowing gaining experience necessary for running a venture (Earle and Zakova 2000). Furthermore, the social acceptance of entrepreneurial behavior was very low (e.g., Wyrwich 2015). This situation is at odds with the empirical observation that many people became entrepreneurs relatively soon after the fall of the Iron Curtain.

We try to better understand this puzzle by taking a Baumolian (institutional) view on the transition period. Our work also builds on previous own evidence, which shows that people who actively committed to the socialist regime had a particularly high likelihood of becoming self-employed (Sorgner and Wyrwich 2022). While this result may appear puzzling at first, it can be explained by applying Baumol's argument according to which people allocate their entrepreneurial talent and effort to destructive, unproductive, or productive entrepreneurship depending on the institutional framework conditions. Consider the following train of thoughts:

Starting a firm is an example of productive entrepreneurship while activities such as rent-seeking and corruption are regarded as unproductive or even destructive. When viewing the economic transition through the Baumolian lens, then the massive institutional change should have also changed the attractiveness of different types of entrepreneurship. Starting a firm—productive entrepreneurship—became attractive over the course of economic transition. This increased incentives to re-allocate entrepreneurial effort toward starting a firm. Against this background, the question is what type of activities were these post-transition entrepreneurs involved in before the fall of the Iron Curtain. How did they make use of their entrepreneurial talent and effort before the transition, when productive entrepreneurial activities were not allowed? In Sorgner and Wyrwich (2022), we argue that, before the transition, post-transition entrepreneurs were already involved in unproductive entrepreneurial activities as indicated by their commitment to the socialist regime. This commitment often came along with material rewards, and therefore, it can be seen as a form of rent-seeking, which—according to Baumol—is a form of unproductive entrepreneurship. We observed this pattern for East Germany but did not analyze other Eastern European transition countries. This raises the question as to what extent the results can be generalized beyond the East German context. This question is justified, as the results for East Germany are partly conflicting with findings for other Eastern European countries (e.g., Ivlevs et al. 2021).

In this conceptual contribution, we discuss why the results for East Germany may be different and in how far these findings can be generalized beyond the East German context. We argue that the results can be reconciled by applying the Baumolian institutional perspective. In this respect, we examine different factors—and formulate propositions—that should be considered when explaining the emergence of entrepreneurship in transition economies other than East Germany.

The remainder of this contribution is as follows. In Sect. 2, we discuss the Baumolian perspective on entrepreneurship and summarize the empirical findings in Sorgner and Wyrwich (2022) for East Germany, while Sect. 3 is devoted to discussing the implications of the results for other transition economies. Section 4 concludes.

2 INSTITUTIONAL CHANGE AND ENTREPRENEURSHIP: THE EAST GERMAN CASE OF TRANSITION FROM SOCIALISM TO MARKET ECONOMY

The most important argument put forward by Baumol (1990) is that institutions determine how people make use of their entrepreneurial talent and how they direct their entrepreneurial effort. In this respect, market economies provide a fertile breeding ground for productive entrepreneurship (i.e., innovative start-up activity) with the quality of the market institutions being positively linked to the level of this type of entrepreneurship (e.g., Sobel 2008; Stenholm et al. 2013). In contrast, in institutional set-ups where markets played a less important role, like in Ancient Rome or in the early Middle Ages, entrepreneurial effort was more likely to be used for unproductive activities, such as rent-seeking (Baumol 1990). To understand the factors that facilitate such significant changes in the type of entrepreneurial effort, we incorporated Kirzner's (1973) work into our conceptual framework. Kirzner (1973) argued that alertness is a key characteristic of entrepreneurs, which is defined as a cognitive capability that positively influences both opportunity identification (Kirzner 1973) and opportunity creation (Kirzner 2009) (for an extensive overview and reflection, see Korsgaard et al. 2016). Alertness as a characteristic of entrepreneurs is not specific to market economies. Therefore, alertness can be also applied to the context of institutional change, which helps to identify opportunities emerging from such a change (for details, see Sorgner and Wyrwich 2022).

In Sorgner and Wyrwich (2022), we make the case that the transition from communism to a market economy in Eastern Europe, and in East Germany in particular, is an ideal set-up to study the shift from unproductive to productive use of entrepreneurial talent and effort. While the institutions in communism inhibited productive forms of entrepreneurship, such as start-up activity, the transition to a market economy facilitated new firm formation. We demonstrate empirically that a significant number of new business owners in East Germany revealed strong commitment to the communist regime prior to German re-unification. This commitment can be considered as rent-seeking behavior, as it was associated with material benefits in the centrally planned economy of the communist GDR, which was plagued by shortages.

Assessing an individual's commitment to the regime retrospectively is a challenging task. Participants in surveys may be reluctant to reveal this sensitive information during a time of change when the personal consequences of their responses are uncertain. For instance, in the context of the GDR, being affiliated with the secret police (Stasi) may have led to material benefits, but it is unlikely that people would openly admit to this, as surveillance activities had a negative impact on the well-being of East Germans and society at large (e.g., Neuendorf 2017; Lichter et al. 2021). Alternative measures, such as party membership or state and military employment, are less accurate indicators of regime commitment. On the one hand, ordinary party membership in the GDR did not necessarily imply high levels of regime commitment (Bird et al. 1998). State and military employment, on the other hand, required specific career decisions and professional specializations, and, thus, cannot be considered a generally accessible strategy for rent-seeking.

Previous literature has shown that telephone ownership can serve to identify individuals who were deeply committed to the communist regime (Bird et al. 1998). In the GDR, telephones were seen as a luxury item due to their scarcity, the hurdles that needed to be cleared to obtain them, and the access to exclusive resources that a telephone line provided (see Sorgner and Wyrwich 2022).¹ Thus, owning a telephone may have also indirectly facilitated rent-seeking behavior. It should be noted that the decision to grant a telephone line in the GDR was politically motivated (Economides 1997), making it unlikely that those not committed to the

¹In 1989, there were approximately 1.8 million telephone lines in the GDR compared with 30 million in the FRG (see Leister 1996).

regime would become telephone owners. Telephone ownership should not be taken as a sign of general wealth in the GDR. It is important to note that income inequality was low in the GDR.² Thus, participation in rent-seeking activities was focused on obtaining specific, scarce material rewards, not on acquiring wealth.³ Telephones were a highly coveted possession, and, thus, an indication of strong commitment to the regime.

At the same time, it should not be expected that all individuals who were committed to the regime and possessed a telephone became self-employed after the transition. Staunch supporters of the regime who sincerely believed in the communist ideology were unlikely to start their own venture after the fall of the Iron Curtain. In Sorgner and Wyrwich (2022), we find that telephone ownership was also prevalent among people who hold value priorities completely opposed to entrepreneurship. More precisely, there is a U-shaped link between telephone ownership and entrepreneurial values indicating that people with either low or high levels of entrepreneurship-facilitating values were more likely to own a telephone. Analogously, not every transition into self-employment should be seen as a shift from rent-seeking activities. Many people started their own businesses out of necessity, as the shock transition resulted in a significant economic decline and elevated unemployment rates (Lechner and Pfeiffer 1993; Brezinski and Fritsch 1995).

Our findings, reported in Sorgner and Wyrwich (2022), confirm that participating in leisure activities that reflect regime commitment is positively correlated with telephone ownership. Moreover, we find that individuals who owned telephones in the GDR were more likely to establish a firm after the German re-unification in 1989. They earned higher incomes as entrepreneurs, and their start-ups had longer survival rates. This suggests that they were able to identify and take advantage of business opportunities arising from changes in the system. People with a personality profile conducive to entrepreneurship and a stronger value for autonomy were also more likely to own telephones. These findings remain

²The average net income of individuals with a university degree was about 15 percent higher than that of blue-collar workers, compared to 70 percent in the FRG. Intersectoral income differences were minimal, too (Alesina, Fuchs-Schündeln 2007).

³These arguments notwithstanding, there are also several further aspects that need to be considered when using telephone ownership. For example, people in certain professions like medical doctors may have had a telephone for different reasons. We control for the occupation and the industry people were active in and run further robustness checks in Sorgner and Wyrwich (2022) to dispel concerns regarding the validity of our measure.

robust even after controlling for factors such as human capital, wealth, and high-level positions in management or the Party. The key result from this study was that regime commitment beyond assuming a top-tier elite position was positively linked to start-up activity in the post-socialist era.

In sum, institutional change, such as the transition from the socialist to market economy, directs individual entrepreneurial efforts in a different channel. Entrepreneurial alertness seems to be a key characteristic of entrepreneurial individuals. As we have shown here, this holds true not just in market economies but also, for instance, in socialist economies, where it had found its expression in rent-seeking behaviors. Once the rules of the game have changed, entrepreneurial alertness helped these same individuals to start their own business ventures in a market-oriented economy.

3 CAN THE EVIDENCE FOR EAST GERMANY BE GENERALIZED? IMPLICATIONS FOR OTHER TRANSITION ECONOMIES

The question arises as to whether the findings in Sorgner and Wyrwich (2022) are specific to East Germany or if they can be generalized to other transition contexts and even to other situations where disruptive institutional change has occurred. Although each country has its unique cultural, political, and institutional developments over the course of history, there might be similar trends that countries in transition share. In what follows, we will discuss several factors—and make propositions—that need to be considered when generalizing the results obtained for East Germany to other Eastern European transition countries. In doing so, we expand on the discussion that was initiated in Sorgner and Wyrwich (2022).

The first factor that needs to be considered is the *endogenous development of institutional change*. This refers to the extent to which individuals who revealed entrepreneurial effort before the transition were able to shape institutional change. Entrepreneurs have been recognized as agents of change (Schumpeter 1912), and there is ample evidence that entrepreneurship in transition contexts leads to institutional change (Smallbone and Welter 2001; Ahlstrom and Bruton 2010; Douhan and Henrekson 2010; Henrekson and Sanandaji 2011; Zhou 2013, 2017; Kalantaridis 2014). For example, in Eastern Europe, the old top-tier elite could shape the transition process and institutional change to their personal advantage by securing monopoly power and subsidies (e.g., Aidis et al. 2008; Kshetri

2009; Du and Mickiewicz 2016). Many new firms in Eastern European transition countries were founded by the former elite, especially in the early period when the institutional framework was still in the formative stages. Smallbone and Welter (2001) argued that, based on Baumol (1990), these “nomenclature” start-ups can be regarded as unproductive entrepreneurship. An endogenous development of institutional change increases the likelihood of profitable rent-seeking opportunities for the former top-tier elite. Hence, the more the institutional change can be shaped by the nomenclature, the lower is the likelihood of a shift from unproductive to productive entrepreneurship. When trying to apply the findings for East Germany to other post-socialist contexts, it is therefore important to consider the extent to which entrepreneurially alert individuals were able to shape institutional change. In East Germany, this extent was rather low, as the readymade institutional framework of West Germany was introduced in the East (see Brezinski and Fritsch 1995, for details). Hence, the institutional change in East Germany was an exogenous shock, while endogenous institutional change can largely be ruled out. In other transition contexts, it is important to disentangle entrepreneurial opportunities emerging through endogenous institutional change from the opportunities picked up by individuals who had no influence on institutional change. This requires a focus on individuals who committed to the regime but were not in top-tier positions and who started firms in sectors with low interaction with government agencies. This rules out the possibility that network effects from the communist period distort the empirical analysis.

Proposition 1 Entrepreneurial opportunities resulting from an endogenous institutional change decrease the scope for productive entrepreneurship after transition.

The first factor partly links to the second factor which is the *post-transition institutional quality*. The theory on the role of institutional quality for the level of entrepreneurial activities (Sobel 2008; Stenholm et al. 2013; Chowdhury et al. 2019) predicts that the adoption of well-established high-quality institutions is positively associated with the level of new business formation. In the case of East Germany, the institutional framework of West Germany made starting a business more attractive compared to Eastern European countries where rent-seeking opportunities remained relatively profitable, partly due to the endogenous development of the institutional framework. Thus, controlling for the level of

institutional quality would be important in a cross-country analysis including other transition countries. A low level of institutional quality may lead to different results as those found in our assessment of East Germany.

Proposition 2 Institutional change leading to the emergence of high-quality institutions increases the scope for productive entrepreneurship.

A third factor to consider is the historical context, namely *pre-communist development*. Considering the role of history is of particular importance, as it provides many examples of how institutional conditions shape entrepreneurship, as discussed by Baumol (1990). Historical development is pivotal for understanding institutional differences. In more general terms, Williamson (2000) argues that historical processes shape cultures, which in turn affect the formation and changes in institutional framework conditions. Apart from this long-term perspective, it might be worthwhile to examine the historical level of economic development in a region. The level of pre-war economic development across regions that became later part of the Eastern bloc varied strongly. Certain regions in Czechoslovakia, East Germany, and contemporaneous Poland were highly industrialized before World War II (Tipton 1976; Fritsch et al. 2021). Some of these regions also had high levels of entrepreneurship, and there still persist regional differences in start-up activities. The latter finding is relevant as previous research shows that this empirical phenomenon is explained by a persistence of an entrepreneurial culture that is pre-communist in nature and was not eradicated by several decades of anti-entrepreneurial indoctrinations and entrepreneurship-inhibiting regulations (e.g., Fritsch and Wyrwich 2019). An entrepreneurial culture can be defined as a “collective programming of the mind” (Beugelsdijk 2007, 190) and may endure despite long periods of anti-entrepreneurial policies.

The mechanisms behind the persistence of an entrepreneurial culture are largely unclear, but there are indications that historical success and the size of entrepreneurial households are decisive for shaping a collective memory that supports entrepreneurship (Fritsch and Wyrwich 2023). When the institutional framework becomes favorable for starting businesses, such as after the fall of the Berlin Wall, an existing entrepreneurial culture can facilitate the re-emergence of entrepreneurship. Re-activation of entrepreneurship by means of an entrepreneurial culture is likely to take place if there is an entrepreneurial tradition. Hence, the likelihood of shifting entrepreneurial effort from unproductive to productive activities

might be also determined by the prevalence of an entrepreneurial culture that facilitates the re-emergence of high levels of new firm formation. Accordingly, there should be also differences across transition regions when it comes to the re-allocation of entrepreneurial talents and efforts. Hence, it is important to consider pre-socialist levels of economic development and entrepreneurship when conducting empirical assessments. The results found in Sorgner and Wyrwich (2022) may differ for other transition economies in that many East German regions had a strong pre-socialist industrial and entrepreneurial tradition.

Proposition 3 Pre-communist institutions, and particularly the presence of entrepreneurial culture, facilitate productive entrepreneurship after transition.

Another factor is the geographic and cultural proximity of East Germany to West Germany, which facilitated *role model effects* during the shift from communism to market economy. Role model effects are a known factor in promoting entrepreneurship (e.g., Bosma et al. 2012). In the case of East Germany, it might have already been relevant before the German re-unification. Slavtchev and Wyrwich (2023) find that East German regions that had access to West German TV had higher levels of entrepreneurship, and individuals being exposed to TV had a higher propensity to start firms. After re-unification, role model effects via direct contacts with West Germans may have also helped to become an entrepreneur. The entrepreneurship-facilitating role model effect due to proximity to West Germany made the re-allocation of entrepreneurial talent smoother. Another advantage of the proximity to West Germany was the access to resources (e.g., subsidies), compared to Eastern Europe countries where there was no unification with an established market economy. Proximity to West Germany also facilitated social capital formation.

Social capital is also a key factor for start-up success (e.g., Kim and Aldrich 2005). In the GDR, active commitment to the regime cultivated social capital that could have played a vital role in the success of ventures following the regime change. The joint exposure to an authoritarian regime, communist ideology, and the socialist command economy had a negative impact on various other factors that contribute to entrepreneurial success. Among the most affected characteristics, one could mention industry experience (Wyrwich 2013), the intergenerational transmission of entrepreneurship-relevant human capital (e.g., Fritsch and Rusakova

2012), and general entrepreneurial skills (e.g., customer orientation, financial skills, critical thinking). These factors required adaptation during the transition, for instance, because work routines in a state-owned company were vastly different from those in market economy firms including start-ups (Johnson and Loveman 1995). On the other hand, social capital might have played an important role. The findings in Sorgner and Wyrwich (2022) demonstrate that weak social ties (associational activity) were more important than strong social ties (friends and family) for obtaining a telephone. Hence, forming social capital through weak ties could be a possible channel through which rent-seeking behavior was eventually rewarded. Thus, telephone ownership reflects the ability to form weak social ties, which is another important factor for successful entrepreneurship (Kim and Aldrich 2005). Thus, social capital acquired in the socialist context may be an important channel for the link between telephone ownership in the GDR and successful start-up activity after 1989. In sum, proximity to West Germany could have facilitated the re-allocation of entrepreneurial talent and effort in post-socialist East Germany due to its positive impact on the formation of social capital.

Proposition 4 Geographic and cultural proximity of a post-socialist economy to an established market economy could be expected to predict the level of productive entrepreneurship after the transition.

The final component that needs to be considered when analyzing the re-allocation of entrepreneurial effort and talent in other transition contexts is the *measurement of entrepreneurial effort* during the communist period. Ivlevs et al. (2021) found that former communist party members who selected into entrepreneurship did so mainly out of necessity due to, for instance, blocked mobility (e.g., discrimination in the labor market). Often, they were less successful as entrepreneurs. This contrasts with our results, reported in Sorgner and Wyrwich (2022), that people who were committed to the communist regime were more successful business founders. We believe that our findings are not in conflict with the results reported in Ivlevs et al. (2021). Our focus is not on party members, but on a stronger commitment to the regime as a form of rent-seeking behavior, which is reflected by access to material rewards, such as a telephone. Some party members may have joined the party for ideological reasons, making it unlikely that they will ever become self-employed. Furthermore, as Bird et al. (1998) point out, becoming a party member did not require a big

deal of commitment. Our empirical measure—access to material rewards, such as a telephone—reflects a much stronger commitment than party membership. This does not mean that the same measure can be applied in other transition contexts. Depending on the country-specific context, there might be more suitable measures to capture regime commitment. It is an empirical challenge to find comparable measures in other transition economies that accurately capture this level and type of commitment to the regime. It might even be an impossible challenge to find a universally valid measure. It is important to replicate our analysis in other transition contexts and to compare the results with our findings for East Germany.

Altogether, there are several factors that need to be considered if we want to understand whether the results that we found for East Germany can be generalized to other transition countries. These factors include finding a comparable measure for commitment to the communist regime revealing rent-seeking behavior (unproductive entrepreneurial efforts), pre-socialist historical developments, post-socialist institutional quality as well as the degree to which post-socialist institutions emerged endogenously, and the geographic and cultural proximity of a transition economy to an established market economy. The case of East Germany is surely not a representative case for other East European transition countries regarding the factors mentioned above. Exogenous entrepreneurial opportunities, the geographic and cultural proximity of East Germany to West Germany, favorable pre-socialist conditions, and the quality of institutions after the transition are certainly the reasons for the results in Sorgner and Wyrwich (2022) to be an upper-bound estimate. Nevertheless, the considerations presented here may be helpful in explaining differences in the level and the quality of entrepreneurial activities among the East European transition economies.

4 CONCLUDING REMARKS

In this contribution, we analyze the conditions for the emergence of productive entrepreneurship in transition economies after an institutional change. We build on the seminal work by Baumol (1990), who proposes that entrepreneurial talent is bound to certain individuals who direct their effort to productive, unproductive, or destructive entrepreneurship depending on the institutional framework. This micro-foundation of his work received relatively little attention in the literature, which mostly focused on the macro-level implications of his theory (Sobel 2008;

Stenholm et al. 2013; Chowdhury et al. 2019). Furthermore, the role of alertness to entrepreneurial opportunities (Kirzner 1973, 2009) in non-market economies was also largely ignored.

Our results in Sorgner and Wyrwich (2022) show that a material reward for committing to an anti-entrepreneurial regime—here, telephone ownership—is positively linked to launching an own venture after transition. This suggests that people with pronounced alertness to entrepreneurial-arbitrage opportunities immediately redirected their entrepreneurial efforts from rent-seeking in the GDR toward becoming their own boss in reunified Germany. Our results indicate that such start-ups were less likely to be driven by necessity and were more successful than other start-ups.

Against this background, the question emerges as to what extent the results can be generalized beyond the specific East German context. The aim of the present contribution is to highlight the context factors that need to be considered in any empirical assessment for other transition contexts in order to make the results comparable to the East German case. Thus, we make several propositions that could be tested empirically in the context of other transition economies. It is an empirical challenge to find a comparable measure for commitment to the communist regime that reveals unproductive entrepreneurial efforts, collect data on pre-socialist historical developments, post-socialist institutional quality, and the degree to which post-socialist institutions emerged endogenously. Finally, the geographic and cultural proximity of a transition country to an established market economy could facilitate the possibilities for reallocating entrepreneurial effort and talent into a more productive channel. Therefore, the results we find for East Germany in Sorgner and Wyrwich (2022) are surely an upper-bound estimate.

Apart from analyzing transition from a socialist to a market economy, as described in the previous section, future research should analyze other dramatic shifts in institutional environments that may have occurred in other countries. Another approach would be to study individual entrepreneurial behavior before, during, and after catastrophic events like civil wars that brought about an exogenous change to the environment (e.g., Paruchuri and Ingram, 2012; Bullough et al. 2014; Miller and Le Breton-Miller 2017; Dimitriadis 2021). Another avenue for future research could be the influence of institutional structures on the link between individual characteristics and entrepreneurial outcomes (e.g., Boudreaux et al. 2018; Boudreaux et al. 2019; Schmutzler et al. 2019; Fritsch et al. 2019).

Our research highlights how individuals respond to a dramatic change in the institutional environment. There are several important research questions that emerge from our study. For example, how do institutional arrangements affect the type of entrepreneurial activity people choose? Future research could apply more narrow definitions of productive entrepreneurship, for example, related to innovation. Future research on institutions and destructive entrepreneurship would be of interest as well. Finally, further research on the impact of institutional change on entrepreneurial behavior across diverse contexts and historical periods will deepen our understanding of the link between institutions and the allocation of entrepreneurial effort and talent.

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When Backwardness Became an Advantage: Professional Stays Abroad in the West as Midwife of the Transformation in Poland

Dagmara Jajeśniak-Quast

I INTRODUCTION

The Polish historian Dariusz Stola, a researcher into migration and a Fulbright scholar himself, titled his 2010 magnum opus on the story of migrations from socialist Poland *Kraj bez wyjścia?*—“A country with no way out?” (Stola 2010). The question mark is pertinent here, since over the years the Poles found many ways out of their rigidly communist

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Table 11.1 The metamorphosis of freedom to travel from the Polish People’s Republic

<i>Year</i>	<i>Total foreign trips</i>	<i>Of which: to the West</i>
1952	12,000	50
1989	19,000,000	5,000,000

Source: Stola (2010, 10)

country.¹ Stola’s book also makes plain Poland’s metamorphosis—from a closed state in the 1950s to a relatively open country at the end of the 1980s. In 1952, the year of the establishment of the Polish People’s Republic (a new name, a new constitution) a mere 12,000 foreign trips by Polish citizens were recorded, and only 50 persons travelled to the West. At the start of 1989, still before the June parliamentary election and the formation of the first non-communist government under Tadeusz Mazowiecki, the Polish authorities recorded 19 million travellers, of whom about 5 million were headed to the West (see Table 11.1).

This quasi-freedom of travel was decisive for the Polish transformation process—runs the thesis of the present chapter on the exchange programmes between Poland and the West. Moreover, Poland was one of the few countries of the Eastern Bloc that were able to develop their relationship with the West using the “advantage of backwardness”. This is the claim that I set out to prove below.

The main boost in relations of whatever kind with the West came in the 1970s (see Fig. 11.1). Thanks to Willy Brandt’s new eastern policy, under the motto *Wandel durch Annäherung*—“change through rapprochement”—an easing of Cold War tensions was achieved. In particular, the Final Act of the Conference on Security and Cooperation in Europe (CSCE) in August 1975 fundamentally marked the beginning of the end of the Eastern Bloc. The outcome of the Conference, which had lasted for more than two years, was to be the peaceful coexistence and cooperation of states with different political, social, and economic systems. In return for recognition of the borders of the post-war order and greater economic exchange with the West, the East made concessions in the field of human rights. Exchange between East and West in the professional and cultural

¹The usage in this chapter of the adjectives “socialist” and “communist” in reference to the history of Poland reflects the distinction between the general totalitarian functioning of a state under the dominance of a communist party (“communist”) and the degree of actual implementation of that party’s programme (“socialist”).

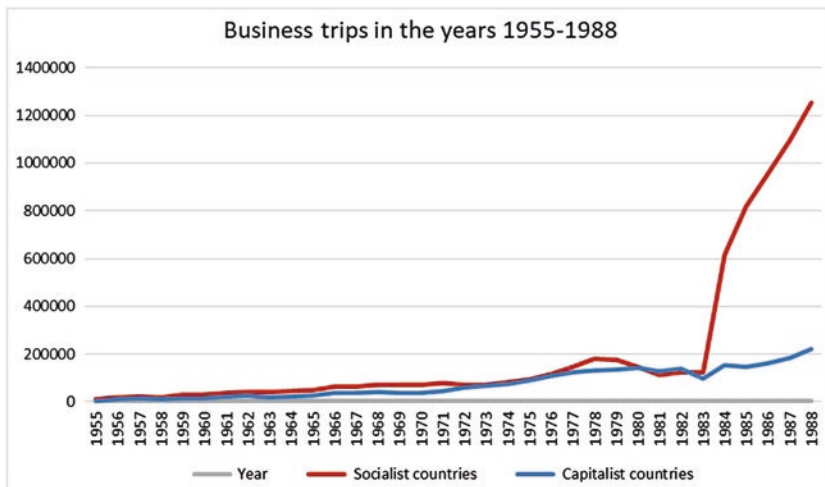


Fig. 11.1 Numbers of professional stays abroad by Polish citizens in socialist and capitalist countries, 1955–1988. Source: Stola (2010, 486–487)

spheres was promoted in particular by the third “basket” of the Final Act, which was intended to ensure, among other things, the flow of information, cultural and scientific exchange, and humanitarian aid between the two blocs.² Poland too had the opportunity to profit from this change in international relations.

As Fig. 11.1 shows, the number of professional visits undertaken from Poland to the capitalist countries rose continuously from 1971 onwards. In certain periods—for example, around the time of the CSCE Final Act—this number was even as high as the number of similar stays in the other socialist countries. The imposition of martial law on 13 December 1981, which saw the closure of the Polish borders, above all affected private travel, which became practically impossible. Official “cadre delegations”³ were permitted

² Archive of New Files in Warsaw (AAN), Rep. 1159—Instytut Badania Współczesnych Problemów Kapitalizmu w Warszawie 1969–1985, No. 1/3.

³ The term “cadre” is used for people who travelled to the West in the time of the Polish People’s Republic. As a rule these were professional trips, made on behalf of an enterprise or a scientific or other state institution. As in East Germany, permission to travel to the West for a shorter or longer time was a great privilege. However, in contrast to what was often the case in East Germany, not every travelling “cadre” in the Polish People’s Republic was “communist” or even a party member.

even under martial law. At the same time, the situation led to a wave of emigration, especially among academics. It is estimated that over 22,000 engineers, 3000 doctors, and over 3000 scientists left Poland for the West, cf. Urban (1998, 83). After the end of martial law on 22 July 1983, the number of professional stays in the West by Polish citizens again increased. However, in view of the selective measures of the party and government, these could not keep up with the rapidly growing number of professional stays in other socialist countries. Also of significance were the contract workers who had been sent from Poland to socialist bloc countries since the mid-1960s, primarily to East Germany, Czechoslovakia, and the Soviet Union. The statistics were further swollen by commuters from the border regions of western and southern Poland, who worked at enterprises in East Germany and Czechoslovakia. Due to the increasingly severe economic crisis of the 1980s and the associated hidden unemployment, particularly among women, additional opportunities for employment in more developed “brother countries” provided visible relief for the domestic labour market and financial support for numerous Polish families. In turn, many East German and Czechoslovak enterprises were dependent on these contract workers, due to a shortage of labour in their own countries.⁴

To explain this phenomenon, the following questions must be answered: Why was the Polish state able to utilise so well the possibility of increased exchange with other countries, particularly those in the West? Why did the Poles in particular find so many ways out of their rigid socialist system? How was it possible, from a political point of view, to leave the country? Were there gaps in the system? Was it possible in Poland to deviate from Marxism–Leninism and open up to the West? Were those professionals who travelled to the West obliged to belong to the communist party? Did the system’s imperfections force the party and state leadership to make Western solutions, foreign contacts, scholarships, and so on useful for the communist state?

An answer is to be found in the theory proposed in the 1960s by the economic historian Alexander Gerschenkron concerning the “profitability

⁴ Poland sent up to 30,000 qualified workers annually to East Germany alone, to perform construction and assembly work. Also around 3000 people, mainly commuters from Poland’s western provinces, worked for East German enterprises near the border (see Jajeśniak-Quast (2005) and Klípa (2019)).

of backwardness". Gerschenkron himself was shaped by his experiences of migration and time spent on scholarships at American universities. Born in Odesa in 1904, he and his family emigrated from Russia to Austria in 1920. Following the annexation of Austria to the German Reich in 1938, he went with his family to the US, where he did research under a scholarship at the University of California in Berkeley, until being appointed to a post at Harvard in 1948. In his book *Economic Backwardness in Historical Perspective*, Gerschenkron described the process of industrialisation and catch-up development in countries including France, Italy, Austria, and Bulgaria, but above all in the Soviet Union and nineteenth-century Germany (Gerschenkron 1962). He saw three main reasons for the fact that Germany, which initially lagged behind Britain in development, was able to develop relatively quickly into a leading industrial nation:

1. First, Germany was able to observe Britain's progress and the solutions implemented there, especially in the iron and steel industry, and was able to emulate that country and thus operate more efficiently or implement certain ideas faster, and often even better (ibid., 10). In other words, it could implement proven technologies that had already become established in earlier developed countries. The cost of such implementation is usually lower than development from scratch; it allows time and money savings and can avoid errors in development. Sometimes it even enables certain developmental stages to be skipped entirely.
2. A further advantage, especially at the start of industrialisation, was the absolutist nature of the Prussian state, which, due to its competitive way of thinking, established universities and financial institutions; these in turn improved education and investment capital and took on a leading role in the centrally controlled process of modernisation (ibid., 15).
3. Finally, due to the *Zollverein* and the founding of the Reich, a unified economic area was created (ibid., 25).

Just as in the time of industrialisation the moderate backwardness of Germany relative to Britain enabled rapid economic development, Poland was similarly able to derive certain benefits from its backwardness from the 1960s onwards. According to Gerschenkron, in a country where the

industrialisation process begins relatively late, different production and organisational structures are formed than in countries that are already developed. Institutions are created that never came into being in the already developed countries, because they were not needed. There is also a significant ideological difference compared with the developed countries (*ibid.*, 7). Gerschenkron emphasises that the European countries had different starting positions. Therefore, the development of countries that followed after Britain did not represent a copy of the latter's development; they had their own different processes. Gerschenkron himself established himself in the US as an expert on Soviet economics (Fishlow 2003). Consequently, despite the different political and economic systems, we can observe all three aspects of Germany's catch-up development in the case of socialist Poland as well:

1. Learning from abroad—this was made possible for Polish scientists and specialists by scholarship programmes and foreign stays. Help in overcoming the relative backwardness came from international organisations, such as the Technical Office of the United Nations in Geneva and New York. Their programmes were addressed primarily to the so-called developing countries. Poland managed to claim this status for itself, and not only to make use of the programmes, but also to shape them to its own advantage by sending specialists to the UN bodies.
2. The absolutist state—in the case of Poland this was the centralised People's Republic, which invested specifically in the training of specialists for both economic systems, for example at the Higher School of Planning and Statistics and the Research Institute for Contemporary Problems of Capitalism, both in Warsaw. Due to the high degree of backwardness and the economic system in place in socialist Poland, it was the state—and not the banking system—that played a decisive role.
3. The *Zollverein*—in Poland in the 1970s there was a relatively broad opening up to the West, with numerous examples of technology and credit transfer and increasing exchange of people and goods with the European Community and North America, especially after the oil crisis and the Helsinki process. The West's selective economic policy also played a large role here.

2 LEARNING FROM ABROAD: THE ROLE OF INTERNATIONAL ORGANISATIONS

Unlike East Germany, Poland was recognised as a state by international organisations, and was one of the 51 founding members of the United Nations in 1945.⁵ Among the countries of the socialist bloc, it was Poland, Yugoslavia, Albania, and Mongolia that made the most extensive use of the programmes of the UN Technical Office. Particularly worthy of mention are the extensive financial resources made available for stays abroad by specialists and scientists in selected Western countries with the aim of gaining professional qualifications (work placements in companies, scholarships at scientific institutions and universities, etc.). Gerschenkron's "profitability of backwardness" applies here too because most of the programmes were directed at the modernisation of developing countries. The following is an extract from one of the reports of the Polish Committee for Foreign Economic Cooperation:

Making use of these subsidies requires complex diplomatic efforts, since United Nations technical assistance is primarily intended for developing countries. It should be emphasised that among the socialist countries, apart from Yugoslavia, Albania and Mongolia, which are treated as developing countries, only Poland has received quite significant subsidies from the United Nations technical assistance programmes [...]

We use the grants awarded to us by UN technical assistance above all for work placements for our specialists in Western countries [...]

[Thanks to] the United Nations we are able to make our specialists familiar with Western factories' methods and production processes, which would be difficult or impossible to access without UN intermediation [...].⁶

The UN's technical assistance was also funded by a number of cooperating organisations, particularly the Food and Agriculture Organization (FAO), the United Nations Educational, Scientific and Cultural Organization (UNESCO), the International Atomic Energy Agency

⁵The following socialist bloc states were also UN founding members: Czechoslovakia, Yugoslavia, the USSR, the Ukrainian SSR, and the Belarusian SSR.

⁶AAN, Rep. 575—Komitet Współpracy Gospodarczej z Zagranicą, No. 18/1, Departament Międzynarodowych Organizacji Ministerstwa Zagranicznego PRL-u, memorandum: Nasze korzyści ze współpracy z pomocą techniczną ONZ, Funduszem Specjalnym i UNICEF Departament Międzynarodowych Organizacji Ministerstwa Zagranicznego PRL-u, 23 July 1965, p. 2.

(IAEA), and the World Health Organization (WHO). Although Poland paid annual membership fees to these organisations, partly in foreign currency, overall, the country was one of the net recipients of financial assistance—similarly as it is in the EU today.⁷

Another factor that contributed to the modernisation of the Polish state was direct aid, in particular from US-based non-profit organisations and the Polish diaspora. A prime example and a symbol of American aid is the construction of a children's hospital in Kraków in the 1960s, which took place thanks to funding provided by the New York-based Cooperative for American Relief Everywhere and the International Cooperation Administration (ICA) on behalf of the US government. To this day, that institution is one of the most modern of its kind in Poland and beyond. The ICA would “utilize foreign currencies accruing to the United States for hospitals abroad designed to serve as centers for medical treatment, education and research, founded or sponsored by citizens of the United States”.⁸ The hospital's formal opening took place in 1965. Because of the financial support received from the Polish–American diaspora in the US government, it was named the “Polish–American Children's Hospital” and became one of the showpieces of political rapprochement between East and West during the Cold War. The Kraków hospital was visited by US President Gerald Ford in 1975, and again by Vice President George Bush in 1987.

Also of great significance, apart from the financial assistance and the transfer of modern showpieces (such as the aforementioned children's hospital), was the opportunity for Polish specialists and experts to observe and gain practical experience of work in the West. These numerous professional visits were often possible only through the mediation of the UN Technical Office, because according to the Polish government, direct contact with Western companies was hardly possible, due to the Cold War and the embargo. More than 50 per cent of all stays and work placements

⁷Ibid., p. 1.

⁸AAN, Rep. 575—Komitet Współpracy Gospodarczej z Zagranicą, No. 18/41, USA: Dokumenty z rozmów inż. Lutosławskiego. Korespondencja 1959–1960, Contract for Architectural and Engineering Services between the Government of the United States and Cooperative for American Relief Everywhere, INC for the construction of the American Research Hospital for Children in Poland for the Medical Academy at Krakow, Poland, 23 November 1960.

undertaken by Polish specialists took place in the industrial sector.⁹ Another factor of great political and economic relevance was the participation of Polish experts, as representatives of a UN member country, in the work of the UN Technical Assistance Administration and its sub-organisations. This was mentioned in a report of the Polish Committee for Foreign Cooperation as early as the mid-1960s:

Our influence on the alignment of multilateral international cooperation is of great political and economic importance to us. These organisations form an important platform for the realisation of coexistence. [...] Moreover, our participation in the United Nations Technical Assistance, the Social Fund, and UNICEF is a means of communicating our views and experiences.¹⁰

Poland was thus able to exert a direct influence on the shaping of the technical cooperation programmes. A further role here was naturally played by the regular visits of UN experts to Poland, as well as research assignments from some specialised UN agencies to Polish institutions. The Polish state clearly understood how to make very good use of this opportunity, although the relatively numerous Polish diaspora in the West also undoubtedly had a role to play.

However, “learning from abroad” was not always uncomplicated. The inflexible regulations of the socialist state often stood in the way, as did ideological reservations. Every trip abroad, no matter how simple, had to be approved at many decision-making levels, right up to the highest levels of government. What in a market economy would have been decided at most in the executive suite of a company was highly centralised—and difficult—in socialist Poland. Nevertheless, the state decision-makers were aware of the importance of the exchange and the unique opportunity of learning abroad, and so the delegations were selected very carefully and for the greatest possible benefit to the relevant branch of industry. This is illustrated by a trip to the US and Canada undertaken by Polish experts from the cellulose and paper industry. In 1960, the American paper manufacturers Parsons and Whittemore invited five to six Polish engineers

⁹AAN, Rep. 575—Komitet Współpracy Gospodarczej z Zagranicą, No. 18/1, Departament Międzynarodowych Organizacji Ministerstwa Zagranicznego PRL-u, memorandum: Nasze korzyści ze współpracy z pomocą techniczną ONZ, Funduszem Specjalnym i UNICEF Departament Międzynarodowych Organizacji Ministerstwa Zagranicznego PRL-u, 23 July 1965, p. 3.

¹⁰Ibid., p. 7.

from the sector, to make them acquainted with the achievements of the North American paper industry. Among other things, the concern supplied machines and technology to the paper factory in Ostrołęka in north-east Poland. The trip thus had the nature of a study visit: the specialists were to get to know the machines that were to be used in Poland in the modernisation and development of the paper industry. The ambitious goal of modernising and expanding the production of pulp, paper, cardboard, and fibreboard, as well as furniture for export, could be achieved only with the use of Western technology. The American technology would enable a 20- to 30-fold reduction in the consumption of water in the manufacturing process, and would also significantly improve the treatment of wastewater from the process. The trip needed to be approved not only by the Ministry for Forestry and Timber Industry and the State Planning Commission, but also by the Foreign Ministry. The recommendation made by the Foreign Ministry to Deputy Premier Piotr Jaroszewicz, who was ultimately also involved in the decision-making process, read: “In view of the type of trip and the fact that it relates to a private invitation from an American concern, I consider it inadvisable for such a delegation to include a member of the government of the Polish People’s Republic—in this case the Deputy Minister for Forestry”.¹¹ The deputy premier thus decided that members of the government would not take part in the trip, but it would include experts from the relevant paper factories.

This is an impressive example of targeted modernisation measures in the Polish socialist economy implemented with the help of study visits to the West, in spite of the obstacles faced along the way. The archived records show clearly that this type of exchange with the US, in spite of all ideological reservations, took place primarily in industries that were to undergo modernisation. The technological backwardness of Polish industry was too great; pragmatism often won out over ideology.

The records also show that from the late 1950s almost every industry and economic sector organised similar study trips to the US for Polish experts. They were often followed by six- to twelve-month work placements

¹¹ AAN, Rep. 575—Komitet Współpracy Gospodarczej z Zagranicą, No. 18/41, USA: Dokumenty z rozmów inż. Lutosławskiego. Korespondencja 1959–1960; Podsekretarz Stanu w Ministerstwie Spraw Zagranicznych do: Towarzysz Minister R. Fidelski—Zastępca Przewodniczącego Komitetu Współpracy Gospodarczej i Naukowo-Technicznej z Zagranicą, Warszawa, 6 September 1960.

and study visits for young Polish engineers and specialists. Invaluable in this context are the personal contacts made, which in comparison with other Eastern and East Central European states were an almost unique characteristic of the backward Polish economy. Business contacts of this kind were often based on personal acquaintance, as is illustrated by a notice from the field of industrial design in the early 1960s. Because Polish industrial design was internationally recognised, the decision-makers hoped for potential export opportunities, and thus offered this private visitor numerous tours and discussions at Polish design centres throughout the country:

Freda Diamond—USA, glass industry consultant, designer and drafter, interior designer, glass design—would like discussions with design offices and representatives of the glass industry, particularly export glass (...) She is visiting privately from 8 to 15 September.¹²

In spite of the Iron Curtain, contacts with the West, and above all with the US, were not interrupted. From the highest circles of government, such as Polish Deputy Premier Jaroszewicz, down to specialists at the lower levels of combines and enterprises, knowledge and practical expertise were exchanged with involved experts, even across the Atlantic. Of the Eastern Bloc countries, only the Soviet Union was engaged in such exchange with comparable intensity. Extensive use was made of contacts with the Polish diaspora in American centres such as Chicago, New York, Detroit, and Southampton. Many problems that had been awaiting a solution since 1947, following Poland's rejection (under Soviet pressure) of the Marshall Plan and the economic embargo placed on the Eastern Bloc, could be at least partially alleviated by this means. For example, Poland was able to obtain US patent descriptions worth several hundred thousand dollars free of charge, after Watson, chairman of the US Patent Office, was received in Poland in late 1959, and his Polish counterpart Professor Muszyński made a return visit to the US in the following year. Although the descriptions were supplied in return for equivalent Polish

¹² AAN, Rep. 575—Komitet Współpracy Gospodarczej z Zagranicą, No. 18/41, USA: Dokumenty z rozmów inż. Lutosławskiego. Korespondencja 1959–1960, Ministerstwo Przemysłu Lekkiego. Gabinet Ministra. Wydział Współpracy z Zagranicą, 17 August 1960.

patent descriptions, experts agreed that the transaction had clearly been to the Polish side's advantage.¹³

Another example of a study visit—this time involving the Polish electrical industry—confirms that the Polish experts visiting the US primarily wished to study mechanisation and automation in the industry, given that manpower in Polish power plants was twice as high as in the US.¹⁴ All of these trips were conceived as exchanges. American experts travelled to Poland, and Polish specialists were invited to make return visits to the US or Canada. According to assessments made by Polish ministries, the advantages of this exchange clearly accrued to the Polish side. In the late 1950s and early 1960s, most ministries estimated that their industries lagged behind the US in terms of technology by six to eight years. The advantages of cooperation with Poland mentioned by the American side were interpreted by Polish experts rather as pure “courtesy declarations”.¹⁵

In the case of the aforementioned electrical industry trip, the invitation for a one-month study visit for 10–12 persons from Poland came directly from the board of Detroit Edison Co., whose experts had already paid a visit to Poland in summer 1959.¹⁶ The US State Department declared that it would pay all of the costs incurred by the Polish delegation in the US. This allowed the Polish side to save its scarce foreign currency.

A common feature of all of these trips was the high professional level represented by those taking part. In the 1960 study trip by electrical specialists to the US, all participants held university degrees, mostly from the pre-war period (five from the Technical University of Lwów [Lviv] and three from Warsaw Technical University). All of them also spoke English

¹³AAN, Rep. 575—Komitet Współpracy Gospodarczej z Zagranicą, No. 18/41, USA: Dokumenty z rozmów inż. Lutosławskiego. Korespondencja 1959–1960, Prezes Urzędu Patentowego PRL, Prof. Dr inż. Zb. Muszyński do Wiceprezes Rady Ministrów Tow. E. Szyr, 7 November 1959.

¹⁴AAN, Rep. 575—Komitet Współpracy Gospodarczej z Zagranicą, No. 18/41, USA: Dokumenty z rozmów inż. Lutosławskiego. Korespondencja 1959–1960; Notatka w sprawie wysłania delegacji energetyki polskiej do Stanów Zjednoczonych, 1 April 1960, p. 3.

¹⁵AAN, Rep. 575—Komitet Współpracy Gospodarczej z Zagranicą, No. 18/41, USA: Dokumenty z rozmów inż. Lutosławskiego. Korespondencja 1959–1960; Notatka dla Wiceprezesa Rady Ministrów Tow. Piotra Jaroszewicza w związku z rozmowami przeprowadzonymi z p. Walker Lee Cislarem, prezesem „Detroit Edison Company”, 26 September 1959.

¹⁶AAN, Rep. 575—Komitet Współpracy Gospodarczej z Zagranicą, No. 18/41, USA: Dokumenty z rozmów inż. Lutosławskiego. Korespondencja 1959–1960; Notatka w sprawie projektowanej wizyty delegacji energetyków polskich w USA, 22 January 1960.

and other foreign languages (Russian, German, French, Czech) to a high standard. The delegations thus consisted not of pure “communist cadres”, but of specialists who knew how to make excellent use of the knowledge and contacts that they acquired.

Another opportunity to “learn from abroad” was provided by traditional representation in the form of Polish embassies worldwide—here particularly in the West. There is nothing unusual in this, since all countries use their missions to collect information. Nevertheless, compared with East Germany, for example, this path was of particular importance to Poland, since the GDR remained unrecognised for many years and thus lacked foreign embassies. The archival sources show in particular that the Polish embassy in the US, especially the Polish trade mission in Washington, was very active in passing on the latest information, and thus in ensuring the circulation of knowledge. That mission regularly informed experts in Warsaw about the latest publications and research results, and enabled access to the most important journals, or at least to abstracts. Paradoxically, journals from other socialist bloc countries and from China also found their way to Poland by this means—via a detour route that crossed the Atlantic.¹⁷

3 THE “ABSOLUTIST STATE”: THE ROLE OF STATE INSTITUTIONS

Like in the absolutist state of the nineteenth century, the Polish communist government created numerous institutions which—with help from the West—would play a major role in the modernisation process. Alongside the universities and colleges, above all the Warsaw Higher School for Planning and Statistics (now SGH Warsaw School of Economics), as well as many technical universities, the Polish government established a number of institutions that today would be called think tanks, many of which are still in existence. Notable among them was the Committee for Economic, Scientific and Technical Cooperation at the Council of Ministers (*Komitet Współpracy Gospodarczej i Naukowo-Technicznej przy Radzie Ministrów*), which was established in 1958, and in 1962 was renamed the Committee

¹⁷ AAN, Rep. 575—Komitet Współpracy Gospodarczej z Zagranicą, No. 18/41, USA: Dokumenty z rozmów inż. Lutosławskiego. Korespondencja 1959–1960; Embassy of the Polish People’s Republic. Polish Trade Mission do Komitetu Współpracy Gospodarczej z Zagranicą, Dot. wydawnictw tutejszego Ministra Handlu, 21 November 1960.

for Foreign Economic Cooperation (*Komitet Współpracy Gospodarczej z Zagranicą*). Its remit included cooperation within the framework of Comecon, but also the UN Economic Commission for Europe in Geneva, and later the EEC. This state institution coordinated bilateral agreements, but was also responsible for cooperation with the UN Technical Office. Under UN technical assistance for developing countries, Poland had access to funds for expert exchanges, work placements, foreign stays, and scholarships from UN funds, from the FAO, UNESCO, the WHO, and others. In spite of the Cold War and the economic embargo between East and West, Warsaw's Committee for Foreign Economic Cooperation often took action to disseminate technical documentation from the West. Of particular interest were the latest developments in those sectors that were key to the modernisation of the economy. For example, in the construction industry, starting from the 1960s, American technical documentation for land development machinery and cement production was made available.¹⁸ From the late 1950s there were also contacts between the Polish committee, the US National Science Foundation, and the Polish Institute of Arts and Sciences of America. This paved the way for numerous scholarships and professional stays in the US for Polish specialists.¹⁹ Other formats for exchange between Poland and the US were also agreed, in addition to the translation of patents and specialist literature.²⁰

However, the Western side also had an interest in establishing contacts with East Central Europe, whether on economic or political grounds. Almost every industry association in the US had specialists responsible for contacts with the "Eastern Bloc". Polish experts also knew how to make use of these contacts. The US specialists were often invited to Poland when they were already travelling in the region, for example, when attending congresses in the Soviet Union or other countries. An instance of this is a trip made by Alexander Gakner from the Washington Bureau of

¹⁸AAN, Rep. 575—Komitet Współpracy Gospodarczej z Zagranicą, No. 18/41, USA: Dokumenty z rozmów inż. Lutosławskiego. Korespondencja 1959–1960, Sprawozdanie No. 2, Waszyngton, 21 August 1960.

¹⁹AAN, Rep. 575—Komitet Współpracy Gospodarczej z Zagranicą, No. 18/41, USA: Dokumenty z rozmów inż. Lutosławskiego. Korespondencja 1959–1960, Przyjazd William E. Sievers z National Science Foundation w USA, 9 August 1960.

²⁰AAN, Rep. 575—Komitet Współpracy Gospodarczej z Zagranicą, No. 18/41, USA: Dokumenty z rozmów inż. Lutosławskiego. Korespondencja 1959–1960, Odpis Centralny Instytut Dokumentacji Naukowo Technicznej.

Mines in 1960, on which he visited the USSR and attended an international mining conference in Budapest. He was invited to travel on from Budapest to Poland, where he was given a week-long tour of the country's leading mining and steelworking sites. From then on, Gakner was involved in arranging study visits to the US for Polish specialists and supplied Polish experts with current publications.²¹

The UN Technical Office in Geneva and New York also cooperated, for purposes of “development assistance”, with Western foundations, above all the Ford and Rockefeller Foundations, in the fields of medicine and agriculture in particular. One result of the cooperation between the Geneva office and the Polish Committee for Foreign Economic Cooperation was the awarding of scholarships from these foundations. As early as 1964/65 the Ford Foundation provided up to 60 scholarships in the natural sciences, social sciences, and humanities, especially in economics, in addition to five scholarships for linguists. This was the beginning of the long-term cooperation that was also an element of Western science policy and diplomacy during the Cold War, as noted by Igor Czernecki (2013), Andrzej Turkowski (2018), Tomasz Zarycki (2009), and Andrzej Wyczański (1997). On the other hand, for the Polish side, this circulation of experts, scientists, and intellectuals was a targeted measure on the path to modernisation—but one that would ultimately lead to the collapse of the system and the subsequent transformation. The Western foundations thus reacted relatively patiently to the initial problems that were signalled by the Polish government, as illustrated by a letter from Eugenia Krassowska, State Secretary in the Polish Ministry of Higher Education, to the Ford Foundation's director Dr Shepard Stone:

I am pleased that the difficulties encountered this year in carrying out the Foundation's program for 1961 have now been overcome and mutual cooperation is continuing. [...] However, I was very surprised that, despite the reservations expressed in my letter of 25 May of this year, the Foundation sent out scholarship notifications to 13 persons. [...] I would therefore be grateful if, prior to the final decision, the Foundation's experts would inform us of the names of all persons considered as candidates for the Foundation's

²¹AAN, Rep. 575—Komitet Współpracy Gospodarczej z Zagranicą, No. 18/41, USA: Dokumenty z rozmów inż. Lutosławskiego. Korespondencja 1959–1960, Notatka z rozmowy przeprowadzonej z Mr. Alexander Gakner /Bureau of Mines/, Waszyngton, 21 June 1960.

scholarships, and that no promises of scholarships would be made to persons to whom the Polish side has objections. [...]²²

Another important central institution for scientific contact and knowledge exchange with the West within the framework of Polish economic and social modernisation, and thus a long-term “midwife” for the transformation, was the Warsaw-based Research Institute for Contemporary Problems of Capitalism (*Instytut Badania Współczesnych Problemów Kapitalizmu*, IBWPK), established in March 1975, having previously been known as the Research Centre for East–West Relations (*Ośrodek Badania Stosunków Wschód–Zachód*, OBSW-Z). Its main tasks included the study of changes in the class structure in the West, the mechanisms by which states functioned, the parliamentary system, social changes, and above all the economy. Much space was given, particularly after the CSCE Final Act, to the subjects of human rights and civil liberties, as well as the West’s economic strategies with respect to the socialist states, before and after the Helsinki Conference. The Institute’s staff prepared reports and analyses intended primarily for the government and other decision-makers. They did not merely study the problems of capitalism at a distance, but regularly took part in numerous East–West conferences and international symposia. They were also involved in the programme of professional and scientific exchanges with the West. The Institute’s research results were also made available to a wider audience, especially through newspapers and journals (such as the quarterly *Kapitalizm*) and by way of international conferences.²³ Members of the Institute not only conducted research into information exchange, interpersonal contacts, and Europe-wide scientific, economic, and cultural cooperation, but in the 1970s and 1980s also put these ideas into practice.²⁴ This was a possibility that was

²² AAN, Rep. 575—Komitet Współpracy Gospodarczej z Zagranicą, No. 18/1, letter from: Eugenia Krassowska, Podsekretarz Stanu w Ministerstwie Szkolnictwa Wyższego, to: Dyrektor Fundacji Forda, Dr. Shepard Stone, 17 October 1961.

²³ AAN, Rep. 1159—Instytut Badania Współczesnych Problemów Kapitalizmu—IBWPK w Warszawie 1969–1985, No. 1/3, Rada Naukowo-Programowa Instytutu, 1976, 1977, Protokół z posiedzenia Rady Naukowo-Programowej Instytutu Badania Współczesnych Problemów Kapitalizmu RSW „Prasa-Książka-Ruch“, 9 November 1977, pp. 3, 5–7.

²⁴ AAN, Rep. 1159—Instytut Badania Współczesnych Problemów Kapitalizmu, No. 1/3, Problematyka wymiany informacji i kultury między państwami o różnych systemach oraz „Praw Człowieka“ w pracach naukowo-badawczych Instytutu. Materiał na posiedzenie Rady Programowo-Naukowej, 15 April 1977.

not available to the same extent to all communist societies, or admittedly to all Polish citizens. In any case, it may be stated that the issues that became crucial during the systemic transformation had been studied and discussed much earlier, a fact that helped accelerate the change.

From the start, the work of the Institute was supported by a scientific advisory board. Alongside the Minister for Science, Higher Education and Technology (in 1975 this was the economics professor Janusz Górski) the board included academics from leading Polish institutions, including the Higher School for Planning and Statistics (SGPiS, known again as SGH since 1991), the University of Warsaw (especially for political science and journalism), the Polish Academy of Sciences (PAN, including the Institute of Philosophy and Sociology and the Institute for State and Law), and the Polish Institute for International Affairs (PISM).²⁵ All of the aforementioned institutions are still operating and conducting research, which was important for the transformation process, and is an example of a continuity seldom found elsewhere in East Central Europe. In turn, the establishment and development of many such “cadre schools” was made possible by the financial assistance of the United Nations. To give just one example, in the mid-1960s the Centre for Executive Training (*Centralny Ośrodek Doształcania Kadr Kierowniczych*) in Warsaw benefited from over one million dollars from the UN Social Fund.²⁶

4 THE “ZOLLVEREIN”: EAST–WEST CONTACTS ESTABLISHED THROUGH STAYS ABROAD

Most Polish documents relating to professional and scholarship exchange between Poland and the West are held in the Archive of New Files (AAN) and in the archive of the foreign ministry in Warsaw. Analysis of these sources, particularly in relation to cooperation with the Ford and Fulbright Foundations, which began in the 1960s thanks to coordination by the UN Technical Office, reveals that there was a high degree of pragmatism in the cooperation between the communist government and the foundation representatives.

²⁵ AAN, Rep. 1159—Instytut Badania Współczesnych Problemów Kapitalizmu, No. 1/2.

²⁶ AAN, Rep. 575—Komitet Współpracy Gospodarczej z Zagranicą, No. 18/1, Departament Międzynarodowych Organizacji Ministerstwa Zagranicznego PRL-u, memorandum: “Nasze korzyści ze współpracy z pomocą techniczną ONZ, Funduszem Specjalnym i UNICEF”, Departament Międzynarodowych Organizacji Ministerstwa Zagranicznego PRL-u, 23 July 1965, p. 5.

A tendency is observed whereby the Polish side was initially particularly interested in exchange in the field of modern industry, science, and technology. Similarities to the behaviour of the German state in its nineteenth-century modernisation process, as described in detail by Gerschenkron (1962, 10), are again visible. Polish preferences clearly lay in such emerging areas as biophysics, biochemistry, electronics, engineering, architecture, and business management, which suggests that the backdrop was a strong pressure to modernise the Polish economy (cf. Table 11.2).

Table 11.2 Overview of Polish Fulbright scholarships in 1969–1971 and 1983–1988

<i>Year</i>	<i>Number</i>	<i>Disciplines</i>	<i>Male</i>	<i>Female</i>
1969–1970	6	Physics, Language and Literature, Sociology	6	0
1970–1971	8	Economics and Business Administration, Education, Language and Literature, Chemistry, Engineering, Animal and Plant Sciences, Bio-Sciences	7	1
1983–1984	25	Biological Sciences, Chemistry, Theatre Arts, Economics and Business Administration, Language and Literature, Journalism and Mass Communications, Linguistics, Medical Sciences, History and Civilization, Engineering, Earth Sciences	19	6
1984–1985	27	Biological Sciences, Chemistry, Computer Science, Earth Sciences, Economics and Business Administration, Engineering, Journalism and Mass Communications, Law Linguistics, Medical Sciences, Physics, Theatre Arts	18	9
1985–1986	26	Biological Sciences, Business Administration, Chemistry, Communications and Journalism, Computer Science, Economics, Engineering, Language and Literature, Linguistics, Medical Sciences, Physics and Astronomy, Political Science	19	7
1986–1987	32	Agriculture, American History, Biological Sciences, Business Administration, Chemistry, Communications and Journalism, Economics, Engineering, History (non-US), Mathematics, Medical Sciences, Psychology	25	7
1987–1988	31	Agriculture, Medical Sciences, Business Administration, Communications and Journalism, Economics, Sociology and Social Work, Political Science, Chemistry, Biological Sciences, Engineering, History (non-US)	23	8

Source: Chlebowska (2020, 37)

The Western side, on the other hand, aimed to have more scholarships awarded to Poles in the humanities and social sciences, and above all in economics. The Western foundations also increasingly provided scholarships in the fields of applied linguistics and foreign language teaching.²⁷ Not least, the political motives of Western economic policy also became clear, combined with the hope of being able to exert an influence on Poland's social elites.²⁸

The list of scholarship candidates was drawn up by the Polish higher education ministry based on proposals from various other ministries, universities, and the foundations themselves. It is clear, however, that in spite of the mutual coordination of the candidate lists and the selection interviews held in Warsaw and Kraków (only candidates who had the approval of the Polish side were admissible), the candidates were by no means predetermined by the party alone. Although the State Undersecretary at the Polish Ministry for Higher Education was already appealing in the mid-1960s for a selection of candidates who, apart from high academic and linguistic qualifications, would also represent a “certain political point of view”, the files show that most candidates, though being outstanding experts in their fields, were not necessarily politically engaged.²⁹ Many of them, especially in the 1960s, were not even members of the ruling Polish United Workers Party (PZPR). For example, among the 12 candidates for Ford Foundation scholarships for Polish heavy industry and the chemical industry in 1964/65 (destination countries: the US, the UK, Switzerland, Sweden, Denmark) there were only two PZPR members; the great majority did not belong to any party.³⁰

²⁷ AAN, Rep. 575—Komitet Współpracy Gospodarczej z Zagranicą, No. 18/1, Notatka pro memoriam w sprawie zasad i trybu przygotowywania kandydatów na stypendia Fundacji Forda, 28 January 1964, p. 1. This memorandum on the rules and procedures for the preparation of candidates for Ford Foundation scholarships is signed by Ford Foundation director Shepard Stone and by Eugenia Krassowska, State Secretary at the Ministry for Higher Education.

²⁸ Cf. the example of the Polish Academy of Sciences (PAN) as reflected in state security and party documents (Pleskot, Rutkowski 2009, 2012).

²⁹ AAN, Rep. 575—Komitet Współpracy Gospodarczej z Zagranicą, No. 18/1, letter from: Podsekretarz Stanu w Ministerstwie Szkolnictwa Wyższego, to: Przewodniczący Komitetu Współpracy Gospodarczej z Zagranicą przy Urzędzie Rady Ministrów, K. Olszewski, 30 January 1964.

³⁰ AAN, Rep. 575—Komitet Współpracy Gospodarczej z Zagranicą, No. 18/1, Ministerstwo Przemysłu Ciężkiego, Wykaz tematów i kandydatów na stypendia Fundacji Forda na 1964/1965 r.

The application documents also show that almost all of the candidates had extensive specialist knowledge in their fields, and indicated very specific wishes to their host institutions. Most of them already had contact with the institutions, knew colleagues there, or gave precise indications of Western firms and institutions that they wished to get to know during their mostly half-year or one-year stays abroad. Apart from their expert knowledge and degree of networking, the applicants also exhibited impressive language skills. In addition to the language of the host country, most of them also had a good command of another foreign language, the most represented being English, German, and Russian.³¹

5 MIDWIVES OF THE TRANSFORMATION

Socialist Poland was one of few Eastern Bloc countries to make targeted use of programmes of professional and scientific exchange with the West. The Western technology transfer that took place from the 1970s did not bring the hoped-for result of rapid modernisation of the Polish economy, as it proved difficult to implement the new Western technologies in the structures of the rigid planned economy. However, thanks to numerous professional stays abroad, particularly from the 1970s onward, Polish specialists and managers had a huge advantage over the other societies in the Eastern Bloc, and they were able to build on this seamlessly when the systemic transformation began. Thus, the professional stays in the West were on the one hand a clear advantage in Gerschenkron's sense, but on the other they were simply a tactic related to political practice. From the 1960s, Polish experts learnt about the mechanisms of the market economy in the West, made valuable contacts, tried out the latest technologies, and built up a rich fund of social capital. In addition, they often accumulated the financial starting capital for the transformation process of the late 1980s, when new firms were established, many of them still being active today (Rybiński 2014, Kamosiński 2023). On the other hand, many of the plants that had been established in the Polish People's Republic suffered collapse or were sold off. The economic and social elites with their Western links were virtually ready for take-off, waiting only for the wind of change that would allow them to operate freely. They included former communist officials or people at the start of a similar career, but also representatives of

³¹ See the numerous personal questionnaires in: AAN, Rep. 575—Komitet Współpracy Gospodarczej z Zagranicą, No. 18/1, Kwestionariusz osobowy.

the opposition, since the beneficiaries of professional stays—as well as private stays (e.g., resulting from emigration)—in the West were not all supporters of the regime, but also included opposition intellectuals. All of them went to make up the post-communist elite after 1989—the midwives of the transformation.

Thanks to circulation of knowledge and their freedom to travel to the West, and using their international networking, former “communist cadres” were able to become midwives of the transformation. This is illustrated by Table 11.3, which lists some recipients of Fulbright scholarships. The list of the most prominent Polish Fulbright scholars reads like a *Who’s Who* of the Polish transformation period. Everyone who took up key political and business posts had previously made one or several professional stays in the West. For instance, Henryka Bochniarz—one of the two women appearing on the list of “midwives” of the Polish transformation in Table 11.3—received a scholarship from the Fulbright Foundation in the mid-1980s and taught at the University of Minnesota. After 1989 she became Poland’s industry and trade minister, and after leaving government she was active in business, serving as chair of the employers’ association until 2019. She founded and managed one of the first consulting firms (Nicom Consulting) and conducted many important privatisation projects in Poland. She belongs or has belonged to the supervisory boards of several companies, including some that are foreign-owned (they include Commercial Union, TVN, Lukas Bank, Agora, TP S.A., Fiat Auto Poland, Unicredit, Orange Polska, and Fiat Chrysler Automobiles Poland). She herself recounts that her American stay had a great influence on the shaping of the Polish economy and system in the time of the transformation. She could also count on her contacts in the US during that time. Many colleagues visited Poland in the 1990s to provide advice and support (Bochniarz 2022, 2023). In the communist era, Bochniarz had completed her studies in the Faculty of Foreign Trade at the Warsaw Higher School of Planning and Statistics, Poland’s economic “cadre school”. Until 1990 she also worked there as an assistant professor and long-term member of the research staff in the Institute of Foreign Trade Prices and Business Cycles. She was a member of the PZPR until 1990.

The second woman on the list, Danuta Hübner, graduated in economics and foreign trade in 1971, at the same renowned Warsaw institution as Bochniarz. She went on to receive several scholarships and visiting positions at foreign universities, including a Fulbright at the University of California. She completed her doctorate in 1974 and her habilitation

Table 11.3 The most prominent Polish Fulbright scholars and their role in the transformation process

<i>Name</i>	<i>Year</i>	<i>US institution</i>	<i>Discipline</i>	<i>Key roles in Poland after 1989</i>
Henryka Bochniarz (b. 1947)	1985–1987	University of Minnesota	National economy	Industry minister, chair of PKPP Lewiatan employers' association, director of Boeing Central and East Europe
Marcin Świącicki (b. 1947)	1976, 1985	George Washington University, Harvard College	Economics	Deputy economics minister, minister for foreign trade relations, mayor of Warsaw
Leszek Balcerowicz (b. 1947)	1972, 1974	Saint John's University	Economics	Deputy prime minister, finance minister, responsible for Poland's transition to a market economy
Marek Belka (b. 1952)	1978–1979, 1985–1986	Columbia University, University of Chicago	Economics	Prime minister, head of the Polish central bank
Włodzimierz Cimoszewicz (b. 1950)	1980–1981	Columbia University	Law and administration	Prime minister, justice minister, attorney general
Danuta Hübner (b. 1948)	1988–1990	University of California	Economics	Deputy Executive Secretary of the UN Economic Commission, State Secretary in the Polish foreign ministry, minister for European affairs
Cezary Stypułkowski (b. 1956)	Late 1980s	Columbia University	Law	Director of several banks, member of the board of the International Institute of Finance
Tadeusz Iwiński (b. 1944)	1977–1978, 1988	Harvard College, University of California	Political science	Member of parliament, observer and member of the European Parliament, State Secretary in the prime minister's office

(continued)

Table 11.3 (continued)

<i>Name</i>	<i>Year</i>	<i>US institution</i>	<i>Discipline</i>	<i>Key roles in Poland after 1989</i>
Adam Biela (b. 1947)	1975–1976, 1981–1982	University of Michigan	Politics and psychology	Member of parliament, observer at the European Parliament
Dariusz Rosati (b. 1946)	1986–1987	Princeton University	Politics and economics	Expert for various international organisations, foreign minister
Grzegorz Kołodko (b. 1949)	1985–1986	University of Illinois	Economics	Deputy prime minister, finance minister, author of socioeconomic development programmes for Poland

Source: Chlebowska (2020, 38)

degree in 1980 in Warsaw, where she has been a professor of economics since 1992. Hübner was a member of the PZPR, but had left the party before the collapse of the system (her membership lasted from 1970 to 1987). During the transformation process she served as State Secretary at the Polish industry ministry, and then became head of the Polish President’s office. From 1998 to 2001 she was Deputy Executive Secretary of the UN Economic Commission for Europe, the same organisation that had assisted the Polish government in its modernisation efforts during the Cold War. From 2001 to 2003 Hübner was State Secretary at the Polish foreign ministry, and from 2003 to 2004 she herself served as Minister for European Affairs.³² Hübner was also Poland’s first EU commissioner, having played a significant role in Poland’s negotiations on European integration since the 1990s.

Another “midwife” of the transformation, Marcin Świącicki, took part in the very first phase of the transformation in 1989 on the government side, being a member of the economic and social policy team at the round table talks. He was one of the authors of the proposal for the conversion of the economy to market principles. In 1989–1991 he was Minister for Foreign Economic Cooperation in Tadeusz Mazowiecki’s government, and he signed the first economic cooperation agreement with the European

³² <https://unece.org/danuta-hubner>. Accessed 30 Mar 2023; <https://archives.cui.eu/en/isaar/734>. Accessed 30 Mar 2023.

Community. He also negotiated successfully with the Soviet Union on the cancellation of Polish debts. In 1994–1999 Świącicki served as mayor of Poland’s capital, and then until 2000 he was deputy minister for the economy and a member of Jan Kułakowski’s team that negotiated the conditions for Polish EU membership.

Świącicki was also a PZPR member, and was a secretary to the party’s Central Committee in 1989. However, from 1965 to 1972 he was also active in the Club of Catholic Intelligentsia (KIK), an organisation more readily associated with the opposition. Świącicki completed his studies in the communist era, like all other midwives of the Polish transformation. He graduated in sociology in 1970 from the Institute of Philosophy at the University of Warsaw, and in the following year completed his master’s degree at that university’s Faculty of Economics and Sociology. In 1981 he gained a doctorate in economics at the Institute of Planning. Before the transformation he had received two Fulbright scholarships and completed postgraduate studies in economics at George Washington University (1976) and at Harvard (1985).³³

To comment on a final example from Table 11.3, the most prominent “midwife” of the transformation is undoubtedly Leszek Balcerowicz. He is often called the father of the Polish transformation, primarily because of his eponymous Balcerowicz Plan, through which he carried out a radical conversion of Poland’s centrally planned economy to a market economy (Balcerowicz 1997). Supported by, among other things, a stabilisation loan from the International Monetary Fund, the plan included a full liberalisation of prices and a curbing of inflationary wage growth. This sudden switch to a market economy has been referred to as “shock therapy”.

Balcerowicz was another graduate in foreign trade from the renowned Higher School for Planning and Statistics in Warsaw. Although he was a member of the PZPR, he left the party after the imposition of martial law in 1981. He received two Fulbright scholarships in the 1970s, and gained a Master of Business Administration degree in the US. Even in the 1980s he published a plan, worked out with friends, for reforming the Polish People’s Republic as a market economy, and this brought him an offer to become involved in the Solidarity programme. In 1989, despite having been offered a position in the UK, Balcerowicz decided to accept the post of Polish finance minister. From 1989 to 1991 he served as Deputy Prime

³³https://mamprawowiedziec.pl/polityk/31024_marcin_swiecicki. Accessed 30 Mar 2023.

Minister and Minister of Finance in the governments of Tadeusz Mazowiecki and Jan Krzysztof Bielecki. In the early 2000s Balcerowicz was head of the Polish central bank, and succeeded in making the zloty a stable currency (Płociennik 2009).

It is interesting to note that almost all of the people listed in the table were associated with the PZPR to a greater or lesser extent. Although party membership was not a necessary condition for embarking on a professional stay in the West, with or without a scholarship, such travel was made more difficult for members of the opposition, the Church and Solidarity, particularly after the imposition of martial law in Poland. Nevertheless, opposition figures were equally active in the West. On the one hand, Western scholarships always remained open to non-party members and Church activists, as the example of Adam Biela (see Table 11.3) shows. On the other hand, the opposition made use of alternative channels, such as Jerzy Giedroyc's Paris-based *Kultura*. The past political affiliations of many of those listed in Table 11.3 thus only partially support the view expressed by Polish sociologists such as Adam Schaff, Jakub Karpiński, and Adam Podgórecki, that the systemic transformation was basically an institutional change created by the communist elite—these were certainly very important voices in the 1990s debate about the influence of the structures and secret services of the former Polish People's Republic on the preparation of the new “elite” for the transformation and the takeover of power. On the other hand there were also very many opposition “midwives” of transformation, so that in the case of Poland one can speak of a mixed elite—fully in line with the round table talks, which took place in Warsaw between 6 February and 5 April 1989, in the phase of the transition from a communist regime to democracy. These talks involved representatives of the ruling PZPR, but also the opposition Solidarity trade union, the Catholic Church, and other social groups. All of these groupings participated equally in the systemic transformation, and we can find representatives of all of them on the list of those who undertook professional stays in the West, some of them long before the transformation took place.

Scholarships, openness to the West, and freedom of travel were helpful in the process of systemic transformation above all for people who had connections to the power system. This statement is a recurrent theme of the sociological debate of the 1990s regarding the responsibility of the communist era elite and its successors for the political transformation. On the other hand, archive documents show that people from outside the

communist system were also involved in the transformation: entrepreneurs, craftsmen, teachers, artists, scientists, journalists, and so on. Many of them had not been members of the party, and often had even been active in the opposition; they also contributed to the transformation through their work (including that done in the West) in the times of socialist Poland.

6 CONCLUSION

The relatively strong international network built up by the Polish elite, even before the transformation process, arose from the unique possibility of using scholarships and other programmes of international organisations, particularly the United Nations and a number of foundations (many of which cooperated with the UN, especially at the beginning). Since Poland was a UN founding member and was classed as a developing country, it could draw on this assistance to a much greater degree than, for example, East Germany, which for a long time was not internationally recognised as a state, or Czechoslovakia, which was counted as one of the developed UN economies. Thus, in Poland's case, Gerschenkron's theory of the "profitability of backwardness" can be employed to explain the transformation process. In the context of the systemic transformation, the significance of professional stays in Western countries, undertaken by Polish experts and scientists from the late 1960s onwards, cannot be overestimated.

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Knowledge Transfer from the Outside or Self-Learning? Keys to Success for the Establishment of Innovative Companies in Eastern Germany After 1989

Anna M. Steinkamp

I INTRODUCTION

The systemic change from a planned to a market economy was not only an opportunity, but above all a great challenge for those wishing to start up innovative, knowledge-intensive, and technology-oriented companies to succeed those that had been nationalized under the “old system.” These entrepreneurs were cognitively trained in ways that did not meet the requirements of democracy, the rule of law, and the market economy (Wagener 2015, 482). They had to catch up on elementary knowledge about the market economy and its legal framework in a short time (Steinkamp 2022, 157). On the one hand, scientists and specialized

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professionals had the competences to solve technical problems or to implement ideas in new products (Günther et al. 2020, 14), but they were forced to produce innovative products in such a way that they would be competitive on the international market.

The question is, therefore, where East German entrepreneurs got the knowledge to run a company successfully under the fundamentally new economic and political conditions. To whom do they owe their success today? This chapter aims, using a qualitative empirical analysis, to explain where entrepreneurs obtained the special knowledge or skills for founding and successfully managing innovative, technology-based, and knowledge-intensive companies in the market economy, when they themselves had been socialized in the “old” socialist system.

2 ESTABLISHMENT OF COMPANIES IN THE TRANSFORMATION PHASE IN THE NEW FEDERAL STATES

Forty years of socialism left their mark on corporate behavior in the transformation phase. Entrepreneurship had been marginalized and systematically pushed back, so that by the end of the GDR, almost no entrepreneurship existed (Ludwig 2020, 18). Millions of entrepreneurially active citizens had migrated to West Germany (Steinkamp 2022, 171).

In contrast, immediately after the systemic change in 1989/1990, East Germany experienced a boom in company start-ups. However, compared with West Germany, a significant number were closely linked to the underdeveloped service sector (cf. Fritsch 1998, 10).

The start-ups undertaken by East German entrepreneurs were associated with many problems. First, the East Germans had little or no equity to set up companies. In addition, due to the lack of collateral, it was difficult to get loans from banks (Schwarz 2022, 149). Another problem was the lack of experience with the functioning of a market economy and with the new legal framework that was implemented along with the transformation in the new federal states (Fritsch 1998, 10). The third problem was the fact that their socialization had taken place at a time when entrepreneurial activities were largely suppressed.

Another characteristic of the transformation in East Germany, which impacted start-up activities, was the enormous reduction in jobs in industry. Start-ups emerged from actual or imminent unemployment; these are

called “start-ups out of necessity” (Kühn et al. 2022). In the long term, such start-ups usually enjoy less than average success (Fritsch 1998; Storey 1994).

3 KNOWLEDGE TRANSFER AS AN IMPORTANT TOOL FOR LONG-TERM SUCCESS IN INNOVATIVE COMPANIES

Knowledge is an elementary basis for establishing and managing an innovative company. Innovations can be neither created nor processed without a high level of knowledge. Even before 1990, socialist countries had a high level of general education and technical skills, but not enough of the business knowledge that is characteristic of the market economy (Knell and Hanzl 1999, 69). Technical knowledge helps to produce an innovative product of the best quality, but business skills help to determine and negotiate a suitable price and to offer a corresponding service to be able to offer and sell the innovative service or product on the market (Rössel 1998, 60). However, several empirical studies show that the proven lack of education of the new East German entrepreneurs in the transformation phase was not a decisive obstacle to entrepreneurial success (Herzog 1998, 85). The level of education of entrepreneurs was often influenced by the system that operated in the GDR. Not every GDR citizen was able to study what they wanted. Not everyone was allowed to graduate from high school. Education in the GDR did not always depend on performance, but also to a large extent on the position of the parents, background, and other characteristics. For example, the children of party members or children of the working class were regularly given preference. On the other hand, people who were active in the church or who were in opposition had difficulties.

The breakdown of the system at the end of 1989 and beginning of 1990 brought to light the different types of knowledge possessed by the populations of the post-socialist and capitalist countries, which resulted in an intensive exchange of information and knowledge transfer in a very short time.

Knowledge transfer refers to the targeted transfer of information, skills, and experience between people, groups, or organizations (Müller 2018, 27; Spelsiek 2005, 27). Knowledge transfer should be carried out in a targeted manner to ensure that the knowledge is tailored to the needs and the existing knowledge of the target group (Schreyögg 2004, 57).

However, successful knowledge transfer requires more than just transferring knowledge. Knowledge transfer is a social process based on trust, cooperation, and a common understanding (Cohen 2014, 289) and is closely related to the characteristics and skills of the people involved in the transfer (Rauter 2013, 28).

The question is: where did entrepreneurs who grew up under socialism get the knowledge or skills to set up and successfully manage innovative, technology-based, and knowledge-intensive companies after 1989?

4 METHODOLOGY

To answer the research question, oral surveys (interview guides with an extended biographical part) were used as a qualitative social research technique. The selected research group, with sufficient common ground, included CEOs or owners of innovative companies, who were required to meet all of the following criteria:

- Year of birth up to 1971 and place of residence up to 1989 in the GDR—this means that they were at least 18 years old in 1989 and were socialized in the old system.
- Founder and owner/managing director with equity investments in an innovative, knowledge- and technology-based company with expenditure on research and development and having headquarters in the new federal states.
- The company founded or taken over by the interviewees still exists today, that is, 30 years after the systemic change.

The categories used to achieve sufficient variation in the cases examined here include:

- Different types of foundations: start-ups, reprivatization, privatization (purchase from a trust), takeover.
- Different levels of education of interviewees; doctorate, master's or engineer's degrees, diploma (college, university, technical college).
- Different years of birth of the interviewees, ranging from 1936 to 1970.
- Different places of foundation (by federal state).
- Interviewees' background in terms of parents' profession and parents' political positioning in the old system.

- Company size: small, medium, large; micro-enterprises (up to nine employees and annual turnover up to €2 million) were not considered in the research.

In total, 26 persons participated in the study, including 13 from the new federal states. All interviews conducted were fully transcribed, anonymized, and analyzed using the MAXQDA program. A characteristic of these studies is that they are not representative. However, the research results will reveal mechanisms relevant to the growth of entrepreneurship.

5 EMPIRICAL INVESTIGATION

Based on the interviews conducted with entrepreneurs, the following typology was adopted in relation to the knowledge and skills of the interviewees:

- 1) Entrepreneurs with family tradition
- 2) Entrepreneurs for self-development reasons
- 3) Scientists with entrepreneurial talent
- 4) Unemployed scientists

5.1 *Entrepreneurs with Family Tradition*

The group of “entrepreneurs with family tradition” includes those interviewed whose parents and, in some cases, grandparents had been entrepreneurs or self-employed craftsmen. Despite the socialist system, they were able to observe their own parents and grandparents and learn what it meant to run their own company. Every day they could see how an entrepreneur acts, thinks, and so on. These interviewees undoubtedly wanted to become self-employed, and there was no other option for them. They reacquired their family businesses from a trust or bought them back.

This type includes Interviewee D and Interviewee G.

Interviewee D (born 1936) is a chemist from Saxony with a PhD. At the end of 1932, at the age of 36, his father, who had a doctorate in pharmacology and came from an independent family of pharmacists, founded a limited liability company together with one other person, to manufacture special medicines. The company developed rapidly, employing 250

people before the Second World War. In 1945, the company was almost completely destroyed and then rebuilt, so that the production of basic pharmaceutical substances and medicines—subject to the many restrictions in place in the GDR—was possible.

Interviewee D was able to decide for himself about his course of studies. When he was five years old he already had a deep desire to study chemistry and take over the family company. Despite his good grades, he was rejected by the Technical University of Dresden. His mother got him a place to study chemistry in West Germany, but he stayed in the GDR, because shortly before he planned to leave the country, he suddenly received an offer from a newly founded technical university for chemistry in Leuna-Merseburg.

For him, studying in Leuna-Merseburg was just a way station; he fought for a place at the renowned TU Dresden, where he was allowed to study from the second year.

Interviewee D witnessed the transformation of the family business into a state-owned business around 1960. After the death of his father in 1968, he took over the management of the company.

He benefited greatly from contacts made at TU Dresden and took those people with him to his company:

D And I hired friends and good people from the TU Dresden, so that we formed a good scientific team and yet could do a very good job, could develop good products. So that was from ... In '68 my father died. (D_DE, pos. 18)

Complete expropriation and conversion to a state-owned company (VEB) took place four years later. Interviewee D was thus forced to give up central management. He was allowed only to lead the research department.

D And then we made a gentlemen's agreement, I became head of research and a comrade from a company with which we were merged became factory manager. (D_DE, pos. 22)

Interviewee D remained in a managerial position in research and development in his former family business until 1990. After that, at the age of 55, he took the opportunity to buy the company from the trust. The privatization contract was signed in 1991.

D *But I was 55 years old. [...] And so it was a wonderful feeling to be able to show again that we are also able to perform. Because we weren't dumber than the West, we were the same genetic pool, we just had a completely incompetent social system where political doctrines ruled, and the achievements of the individual were not recognized at all. (D_DE, pos. 22)*

The impulse to reprivatize the company came from the interviewee himself:

D *And in the end, privatization was only possible after October 3rd, when we had unity. And then I contacted the trust company. And for the trust company my story was, the story was practically a story from a picture book, an exemplary story, like something out of a picture book. Company taken over by father, expropriated, stayed in the company and now again applying for reprivatization. So, I found very constructive people there to talk to. And the trust company went through several phases. (D_DE, Pos. 62)*

After the change of system, Interviewee D found his sales markets secured due to the specifics of his industry:

D *We had a good substance in terms of products. And it was different in the pharmaceutical industry than in the automotive or motorcycle industry, for that matter. The young people naturally wanted to buy a Yamaha motorbike or a Honda motorbike after reunification, not one made in the GDR. On the other hand, the doctors knew modern pharmacotherapy very well, it's like surgery without a knife, you can use a drug with lots of benefits, but you can also cause harm. So they stayed with their products that they knew, with the old GDR products that were thoroughly tested in terms of drug law, that were approved. And so sales were also secured in the start-up phase. (D_DE, pos. 66)*

Nevertheless, he intensively attended lectures on the market economy and sought contacts from whom he could learn something. His cousin, who worked in top management at Siemens, said to him: *"You seem to me like a dried-up sponge that soaks up everything"* (D_DE, pos. 70). The interviewee continues: *"Of course, gathering information was the most important thing. And it was, by the way, also typical for the GDR. It wasn't the*

material shortage that was decisive, it was the lack of information. The information deficit” (D_DE, Pos. 70).

The interviewee admitted that he had no knowledge of how the market economy worked. However, he himself was looking for people in West Germany who could pass this knowledge on to him:

D We, of course, hired management consultants, and they, for example, switched the wage system to West German. ... We had no idea about West German collective agreements. So from one day to the next, we had to convert our wage system to the West German chemical wage agreements, we had no idea. So additionally, we got a West German consultant, who then got himself a sub again. So he then did this work in payroll accounting and set the wage groups, i.e. wrote them out and changed them over. (D_DE, pos. 68)

The interviewee comes from an educated middle-class family. Reading books was an everyday activity for him. He had already read West German books on business administration in the GDR:

D But I was always interested in business administration. And we have a very good library in Dresden, the Saxon State Library, which always had new acquisitions of Western books. And I always read business literature there. Simply out of curiosity. Not because I could have used it for my work, but simply out of interest. It was also one of those, yes, intuitively, such a coincidence that I was interested in it. And of course, that could all benefit me then. So that’s what I learned still during the GDR times. (D_DE, pos. 80)

Interviewee D has also received a great deal of support from West German business associates, whom he sought out in West Germany himself. For example, they showed him how a balance sheet is set up or how production is established:

D I received lots of support from West German business friends. So they were honest in trying to help here. And, for example, my daughter and I went to [name of company X] in Frankfurt (Main) and there the doctor [name] has all his library books and balance sheet spread out, confidential documents. He said, “Forget the numbers again because you’re out again ... but I’d like you to see how a balance sheet is built up

and the profit and loss statement and the like. [...] After all, the money in the West has been hard-earned. [...] And in addition, the loyalty of West German business associates. The network is perhaps an exaggeration.” (D_DE, Pos. 88)

In summary, it can be stated that Interviewee D, who set up a company with up to 150 employees, received his knowledge of the market economy primarily from West German business partners or West German consultants. He was open to making new contacts, which he specifically sought in West Germany. He had already studied specialist literature from the Federal Republic of Germany while living under the old system. He also took part in continuing education courses for entrepreneurs.

Another entrepreneur of type I, an “entrepreneur with family tradition,” is Interviewee G (year of birth 1963) from the state of Brandenburg, whose father, grandfather, and great-grandfather were already self-employed entrepreneurs:

G That’s where the optics industry was born. And we have been here since 1895, my great-grandfather industrially built up the company there. Before that, we were goldsmiths. And we guess, we were already gold workers before that. And glasses were made in [name of city]. And there a lot of gold glasses were made. And then he implemented that in production. But we don’t know any more since 1895. (G_DE, pos. 11)

The great-grandfather, who was a master craftsman, employed around 35–45 people in the 1930s before the Second World War. The great-grandson, Interviewee G, reached a similar level with his company in 2022, with 46 employees.

Interviewee G always wanted to be self-employed:

G I got my independence, I think, from the family in my blood. [...] And I think that this entrepreneurial instinct somehow runs in my family. Because it doesn’t bother me that I just continued to work here in the evening. There are entrepreneurial families like that. I think that’s the way it’s passed on. Something has to be there. (G_DE, pos. 95)

In the GDR era, the family had a much lower status and much less money than before the Second World War. It fought unsuccessfully against the GDR’s restrictions. The family was allowed to continue producing

glasses as a private business in the GDR for two decades. The endpoint was the year 1972, when complete expropriation took place and the company had to be converted into a VEB. The father, who ran the company, was suddenly employed in the company as a foreman and contact person for custom-made products, but also as a stoker. Although the father continued to work there, he was no longer allowed to enter many areas of the firm. He was increasingly degraded:

G As a result, after 1972, my father was not only the manager but also a stoker. He had to do both. He wasn't allowed in at times, not even into his own company building, to check whether the heating was working at all. It was so bad, practically dictated from above. (G_DE, pos. 83)

Because of its involvement in the church, Western relationships, and self-employed status, the family experienced many restrictions and inconveniences in the GDR era, which also had a negative impact on the education of its members. For these reasons, for example, Interviewee G was not allowed to take the Abitur:

G We are a church-going family. After we left school, my brother was able to graduate from high school. And they denied it to me.

I Why?

G I don't know. I can't tell you. You had practically to change to eighth grade back then, right? Although I was the best in my class, that wasn't of interest in that case. (G_DE, Pos. 7–9)

He was also denied sports training at the better sports clubs in the GDR because of his Western relationships.

The interviewee was very interested in scientific equipment construction in the field of laser technology and optics, and his father helped him get an apprenticeship at an optics company in Berlin, where he was able to obtain a master craftsman's certificate. Immediately after completing his apprenticeship as a master craftsman, Interviewee G founded his own company on 1 January 1989, still in the GDR era, at the age of 26, and he took over the family business from the trust a year and a half later:

G Then I took on my father as an employee. We were able to take over the company on 2 August 1990. Then we practically got the property back

through a notary, but had to pay back the entire amount that was paid at the time. (G_DE, pos. 83)

As of 1990, a number of previous job titles were abolished, so that in order to work in certain areas, one had to catch up on qualifications, which Interviewee G also did. He also lacked business knowledge about the management of the company. He attended many training courses and made intensive contacts, from whom he was able to obtain further information:

G *Then I have special education. [...] We had to deal with VAT and all that in 1990, so first of all, you had to understand what that [means]. We all had no idea about it. Yes, what is VAT? Hm. Yes. Training, what do we do with devaluation? [...] And inventory, so how is it all? I was self-employed for a year. Economically no idea. I knew how a combine is structured, who has a say in that, right? But not how to edit business performance indicators. That didn't exist. You had to learn all that. That's what you want for yourself, professional leadership seminars, or we have everything, everything well-read and everything asked around. (G_DE, pos. 91)*

Interviewee G, who completed the technical school for ophthalmic optics in Jena during the GDR era and also acquired three master's degrees, attached great importance to further training for himself and for the company's employees. For him, attending seminars was an "exchange of experiences, there is further education, there is development" (G_DE, pos. 93). He spends 2 percent of sales annually on research and development in the company, that is, between €40,000 and €200,000.

To the question: *What do you see as the decisive aspects that have made you so successful?* he replies: *"The basis, I think, is my education. Education is important"* (G_DE, pos. 101).

Despite their different ages and different training, the two entrepreneurs of type 1 show typical innovative entrepreneurial skills in line with the 100-year-old definition of an entrepreneur according to Schumpeter. They seek and implement solutions on their own initiative, have a strong ability to be enthusiastic, but also enjoy creating things and have a strong will to build something of their own (Schumpeter 1997).

In addition, one notices the so-called peer effects in both entrepreneurs, that is, a tendency toward entrepreneurial independence shaped by

role models in the family and in social networks (Fritsch and Wyrwich 2021, 46). The interviewees' perception of entrepreneurial activity, despite the terrible experiences in the GDR associated with expropriation, encouraged rather than discouraged the desire and ability to engage in such activity. Their technical knowledge was acquired through studies and apprenticeships; however, apart from the systemic change, the passing on of industry- and company-specific knowledge and experience through the generations was of great importance.

5.2 *Entrepreneurs for Self-Development Reasons*

The type “entrepreneurs for self-development reasons” includes people whose parents were not entrepreneurs, but who nonetheless developed entrepreneurially at a very early age. They are similar to type 1 entrepreneurs: they like to create new things, and have great assertiveness, ambition, enthusiasm, and leadership skills. Some of them were able to earn their first money through small jobs in early childhood. In their professional lives, back in the GDR era, they noticed that their strengths lay in negotiation, contacts with customers, and the development of business strategies. The systemic change in 1989 and 1990 presented them with an opportunity for entrepreneurial self-realization. They especially wanted to be independent. The impulse to found a company came from intrinsic motives. Two entrepreneurs are presented as examples: Interviewee I, who has built up an innovative company with up to 1200 employees, and Interviewee J, who runs a high-tech company with more than 250 employees.

Interviewee I (born 1949), who is now a millionaire, grew up in great poverty in Thuringia. His father fled to West Germany in the 1950s, leaving his wife and three children behind. Contact with him was lost. The interviewee's mother lost her job in administration because of her husband's flight to the West. She had to work shifts in production for over a year. After the war, all four family members lived in a single room in an old castle and used an outdoor toilet.

As a child, Interviewee I guided tourists around the castle and was able to earn a small amount of money of his own. He was also happy to help his mother at the cash register:

I [I] always had to help my mother at the cash register. [...] Therefore, in that respect, the sense of business was actually already developed in childhood. (I_DE, pos. 10)

After the tenth grade, he did an apprenticeship as a chemical laboratory technician:

I Then I did the tenth grade, it wasn't that easy to go to high school. I don't know if I would have made it either, no idea. And then, out in the tenth grade, I trained as a chemical laboratory assistant, a metallurgy laboratory assistant in the stainless-steel works. (I_DE, pos. 10)

His first job in the early 1950s was in a large combine in Thuringia, where he remained for the next 20 years and which he bought in the 1990s. He remembers the job as a very valuable experience, as a kind of professional development. What he valued most was that during the GDR era he had professional contacts with people outside the socialist zone. In this way, he learned other mentalities, other modes of acting and realities:

I I worked in an application center, which was also important. You had this contact with the outside world, that is, the West, which was actually good for us in this laboratory, then [name] had that, that was it, shall we say, a very Western manager with a Western touch in his style who actually tried to bring [name of combine] into international business and then also built up such an application, where I worked in research beforehand and then in the application. Well, those were essential interfaces that shaped you. I was also selling insurance at the time. So the sales aspect didn't suit me so badly. Actually, still today. (I_DE, Pos. 10)

Interviewee I has great entrepreneurial talent and a high level of intuition. During the period of reunification, he tracked market changes and used these opportunities for himself. He founded, among other things, a sales company for West German products in East Germany, and looked for business partners in West Germany on his own initiative:

I Then came the change. And 1989. And I read the newspapers at home in 1989, yes, and then the first Western consultants were also in the newspaper, advertising that they were helping with founding a company and such. It was New Year's Eve, I called my buddy right away, [...] I ran over there and said: "Hey, look, isn't that something for us?" So we thought about what we could do, a video store, taxi drivers or something

else. And then I said from my side, I say: "No, you know, [Max],¹ what we can do is stay in our own business, in analysis technology, and look for partners in the old federal states." Because they will all come with much more modern technology than we at [combine] could ever have developed. (I_DE, pos. 10)

Banks were unwilling to lend to Interviewee I. His application for a DM 20,000 loan was rejected. He received the greatest support from three West German clients. They provided him with office equipment, cars, and technology free of charge:

I We had [business partners] who are based in the Freiburg area. [...] They said: "When you drive your cars, Trabi, that won't work." They gave us an air mattress, a tent, we have desks from [name of the company], so these devices, infrared spectrometers. They gave us the technology for free so we could demonstrate it, so we could show customers. The [name] company, that's in Breisgau, they also had a computer available for us, we didn't have anything. And the company [name of the company from West Berlin] gave us an Opel Omega back then, a car. Yeah, we were proud like never before. With our Wartburg and Trabant, that was not the car to drive to a big customer, but. ... That gave us incredible support. Yes, down to the furniture. They were really happy with how we developed. And that's why, especially in the early days, a characteristic feature was that we had a lot of backing. Who knows how it would have been otherwise? So, everything came together really well for us. (I_DE, pos. 120)

Interviewee I managed the sales company very successfully for five years. In 1995 there was a chance to take over the combine. The combine in which Interviewee I used to work had problems with the sale of the products developed there in the mid-1990 s. Initially, buyers were sought in Switzerland and Italy. However, a former colleague of Interviewee I offered the possibility of buying part of the combine, including the research and development department. After successful negotiations, Interviewee I bought the combine with his partner Klaus for over DM 1 million and with the support of subsidies.

¹ All personal names have been changed for the purpose of the chapter.

I It was the turning point in our company because we were suddenly responsible for all of the [combine] products, which were all still on the world market. [...] We had to take on the service technicians, take on employees in production, we were suddenly a company with research and development, with production and sales internationally. (I_DE, pos. 10)

Interviewee I was looking for a partner in West Germany who could invest in the company. He used existing contacts and convinced them to take a 25 percent share. The West German co-shareholder pushed for an immediate IPO (initial public offering), but Interviewee I, who held the majority of the shares, had to admit that he had no idea about stock corporations:

I [...] took part [and] then asked me why I think they are participating. I say: "Well, you just believe in us a bit, don't you?" Says (laughter) the other, [names], who is still a lawyer today, said: "Well, you mustn't dream, we want to make money with you, and there would be an IPO then." I say, you, I didn't even know what it was that they wanted from me. And then we still [performed an IPO]. (I_DE, pos. 10)

Interviewee I learned how the market economy works from his business partners. During the GDR era, he was in contact with foreign customers and suppliers from capitalist countries. He wasn't allowed to go abroad, but foreign customers visited him at the combine. According to him, these first foreign contacts in the GDR played a very major role in his later development. After the systemic change, he specifically looked for business partners in the old federal states in order to sell their products in the new federal states. Cognitive change takes time (Wagener 2015: 482); in this case Interviewee I needed five years in the business of distributing and collaborating with West German companies to become ready to buy part of the combine in Thuringia and take on innovative products made locally to distribute worldwide.

The type "entrepreneur for self-development reasons" also includes Interviewee J, born in 1960, who currently runs an innovative company with its own research and development department, with over 250 employees, operating in Saxony in the environmental measurement technology sector. He became a millionaire by setting up his own company. He originally comes from a working-class family in Saxony-Anhalt:

J My mother was a kindergarten teacher, my father was a truck driver, a truck driver on construction sites, so no outstanding academic education, but you could say, skilled workers. (J_DE, pos. 10)

His house was very modest. Even as a six-year-old child, he was earning money on the sports field, lining up skittles, among other things. He really enjoyed this:

J Then there was always one mark per hour. So you could buy a lot for one mark. And then there were the folk festivals, where you could set up skittles and collect waste paper. You could earn money there. So earning money was always very important in order to be able to afford something. Because pocket money was not much. It was not a disadvantage. Well, we never saw that as a disadvantage, it was fun. That was encouraging. (J_DE, Pos. 18–20)

At school, he was never the best, being rather an average student, but he was selected for high school. He wanted to study psychology, but then got a place to study in the field of environmental technology:

J And since we were in East Germany back then, not everyone could study what they wanted. [...] I also wanted to do psychology. And then there was no study at all. And then they said: "But we have something new. Environmental technology." I say: "Environmental technology?" That was in 1978. Everything was dirty, the water was dirty, and the air was dirty. Environmental engineering. For the first time, there is this as a degree. Technology. I said, "I'll do that." And that's how I got into process engineering with a specialization in environmental protection technologies. Therefore, coincidence. Actually, they recruited me because I had something similar with my girlfriend back then. (J_DE, pos. 28)

After he had completed his studies, his thesis supervisor offered him a place on a doctoral degree course, which he gladly accepted and successfully completed.

In 1987, Interviewee J left the Technical University with a PhD in engineering to work for a large company, *which at that time had already encouraged and co-financed this doctoral work* (J_DE, Pos. 64). For this company, he implemented his research results in the area of research and

development, and two years later, he took over the management of the research and development department.

Shortly after the systemic change, he was offered a job in western Germany as a department manager at an industrial company. He refused and chose 20 people from his old company with whom he would continue working in his own new company. To the question: “Why did you want to start your own business?” he answers:

J There was the chance. The chance was there. So, the business was broken up in 1990. That was clear. [...] And I was 29 at the time. And that was an opportunity. From today's perspective, that was actually irresponsible because it was just rubbish. We had no money. Ancient buildings. And people were poorly trained for the competition that was coming. And we had no orders. (J_DE, pos. 72)

The trust wanted DM 1 million for the business. Interviewee J needed copartners. He persuaded three people from the combine to join him: his former boss, a lab technician, and a person from production. He specifically sought the fourth person in West Germany. Interviewee J already had professional contacts with foreign and West German partners, which he had established at the combine. These were sales representatives from Bavaria and Switzerland, where he was allowed to buy dust measuring technology at the end of the GDR period. Due to the lack of hotels, the business partners from the West had stayed at his home, so that contacts were already established on a personal level.

On the subject of company composition, he recalls the following:

J And then, in the end I got five people to get involved. Once upon a time, there was an employee from the workshop, he is a millionaire today. He sold his shares last year. He bought a semi-detached house with his wife and child and lives here. He is already 75. A former boss of mine who is already dead. A former laboratory assistant who later sold her shares. At that time, Mr. [Müller] from [Bavaria] was still a shareholder. He got SO many shares back then for little money, a foundation, and then sold for double-digit million amounts a year ago. I made them all millionaires, so to speak. But then I needed the money. And because even as a young person, I didn't know what to expect. (J_DE, pos. 82)

The interviewee negotiated with the trust. Instead of the desired million, he had to pay only DM 300,000 for his companies. Unfortunately, he had no money to pay the share capital. At that time, the banks did not give any loans for founding such companies. However, he quickly found a solution:

J I needed money for the foundation, and I didn't have any money. Back then, I had a small terraced house here in [name of town]. And then I went to the bank and said I wanted to remodel the house. And then I got 50,000 or 100,000 for the house. But I didn't build. I founded the company with it. (J_DE, pos. 84)

He gained knowledge about managing a company in the market economy in various ways. He acquired technical knowledge during his studies. The copartner from Bavaria taught him the basics of management. In addition, he attended an evening school for management training and read a large amount of specialist literature.

With a PhD in engineering, Interviewee J was able to do research and develop new products. However, his strengths lay more in his entrepreneurial skills. He was good at negotiating, persuading, and winning new customers, and had great assertiveness for his visions and strategies:

J For the first ten years, I was on the road a lot because I was in sales. So a lot with customers. Because I was able to persuade using extremely good application knowledge. So, I was able to convince customers, not only, that I could say what we sell. Because we don't just have devices, we didn't have anything of our own, we sold solutions. So, I developed, delivered and supported complete solutions for customers. That was our advantage. (J_DE, Pos. 88)

Interviewee J, similarly to Interviewee I, had already had experience with West German business partners in the GDR era. After the systemic change, he offered a partner from West Germany the opportunity to join him in establishing a knowledge- and technology-based company.

5.3 *Scientists with Entrepreneurial Talent*

The type “scientists with entrepreneurial talent” includes people who have acquired a scientific or technical education out of their own interest and

also have strong entrepreneurial skills. For these entrepreneurs, technical knowledge plays a much more important role in their running a company than business inclination. An example of this type is Interviewee K.

Interviewee K (born in 1964) grew up in a village in Saxony-Anhalt. His father was a mechanical engineer with a PhD in economics, who worked as a director of cement plant construction and then became director of a combine. The interviewee's mother was a chemist. Other ancestors were often independent artisans. His grandfather had his own bakery, and his great-grandparents had their own brewery around 1900.

Interviewee K founded his own renewable energy company in the state of Brandenburg together with a shareholder from Dresden and built it up to a size of over 800 employees.

As a child he had always been interested in physics. He was later able to choose his place and course of studies. Until 1989 he studied nuclear technology at the Moscow Energy Institute. He also wanted to study for a doctorate, but due to the change in the system, that was no longer possible. After his studies, he returned to Germany and worked in a state combine for power plant construction, being obliged to work there due to his length of service. The combine was converted into a public limited company, and interviewee K gained initial experience in public tenders. He worked with a business partner from Dresden, with whom he founded his own company in 1993 to build systems. The first two employees were hired in 1995.

To the question: “*When you started a company, what were your hopes?*” Interviewee K does not talk—like other interviewees from groups (1) and (2)—about the chance to build something of their own or the possibility of earning “good” money, but gives arguments of a technical nature:

K At the beginning of the 1990s, I gave it some thought. Because we realized back then that we couldn't get nuclear fusion under control. We can't do it. We haven't made it to this day. Definitely not in time. It was also clear that nuclear fission, i.e. nuclear power plants, as the saying goes, nuclear fission is very limited in time because there is not that much uranium and because it is also a hazardous technology. [...] And then I tried very, very early on to simply think about what else IS possible. You can do all the math with an adequate education in physics. And then it was pretty clear that solar energy would work, but it's still very expensive. Wind energy is also possible. Especially when you have storage. And that is what we are seeing, in reality, today, i.e. hydrogen

as a storage medium was very, very firmly planned from the start. You can't do it without storage. [...] It didn't go together with the big company. They were too expensive. Okay, let's continue on our own. The first facilities were built. That worked surprisingly well, as I said, they are still running today. (K_DE, pos. 161)

Interviewee K acquired knowledge about the market economy himself through specialist literature:

K Yes, there was no special support like that. Well, my father put several books on corporate law on the table for me early on. "Here, read this. May help." So how does it work now within the new legal environment, how do companies work, how do limited partnerships, corporations work, how does tax work. I read that one too. Definitely didn't do any harm. But other than that, there wasn't much support worth mentioning right now. So where was it supposed to come from? (K_DE, pos. 165)

When asked: *Where did you get the knowledge to run the company?* he considers only technical knowledge. Knowledge of how the market economy works is marginalized:

K The technical knowledge to do renewable energies, you have that when you have a nuclear physics education. So, you just have to. Statics, chemistry, electrical engineering. ... Well, what you don't really need now, but what is nevertheless helpful is how nuclear fission works, how does nuclear fusion work, you don't need that right now, right? But generators, networks, voltage, three-phase current, I was allowed to learn everything, right?

I What about management?

K Yes, management doesn't play such a big role at all. Not at the beginning, anyway. (K_DE, pos. 173–175)

Interviewee K, who had gained a technical degree in Moscow, used the first three years of transformation to gain professional experience in the free-market economy. During the GDR era, he had no contacts within Western Europe at all, and had not sought any contacts that could have helped him to found or run a company.

5.4 *Unemployed Scientists*

The “unemployed scientists” type includes interviewees who started an innovative company because they had lost their job. These were foundations of necessity. All interviewees from this group worked in the research and development sector in the GDR era. This type includes, for example, Interviewee C and Interviewee H.

Interviewee C (born in 1959) comes from a working-class family in Thuringia. His mother was a master hairdresser² and his father was an industrial foreman. He was “pushed” through the DDR system. He was selected for high school and then told what to study and what to do for his PhD.

C That was determined in the GDR, like that. The decision was made for me. Of course, I never thought I would study, but somehow the system decided that for me there, yes. And as I went to the advanced high school, that’s what we call grammar school now, I was told there: “No, no, you’re studying engineering,” like that. And then, that was chosen for me, what are the interests? So, the interests are optics, photography in the broadest sense, and, yes, that’s how it happened. So, it’s not like I really wanted to study optics from a young age, yes. (C_DE, pos. 13)

Interviewee C did not in fact want to study but wished to complete an apprenticeship as a radio and television mechanic. He said: *And that was simply rejected, and they said: “No, you will not. (Laughter) You are studying.” Yes? (C_DE, pos. 57).*

After graduating and completing his doctorate, he worked in a Brandenburg combine. After the systemic change, the combine was closed, and all jobs were lost. Consequently, he founded his own optics and electronics company in 1991.

Thirty years later, he continues to run that company and employs 19 people, which is relatively few compared with the other interviewees.

²In Germany, a master craftsman or craftswoman (*m. Meister, f. Meisterin*) is a holder of the *Meisterbrief* (master’s certificate), which is the highest professional qualification in crafts and is a state-approved grade. The qualification includes theoretical and practical training in the craft as well as business and legal training. Additionally, it implies a qualification to train apprentices. These qualifications prepare the *Meister* to run their own business, or alternatively for higher positions at a company.

He admits that 30 years ago, he had no idea how the market economy worked:

C *You really had no idea about anything. You have to say it like that. Everything you can do now, you know and do, we did not know anything. So actually, everything was a totally new experience. (C_DE, pos. 93)*

Interviewee C did not seek contacts in West Germany, but brought a colleague from the institute where he had written his dissertation, and founded a company with him, each having a 50 percent shareholding. He acquired the necessary knowledge himself. For him, it was *learning by doing*.

Interviewee H (born in 1949) from Saxony also represents the “unemployed scientist” type. His father was a mathematics teacher, and his mother was a salesperson. His maternal grandfather had a private business: a car paint shop with six employees:

H *He had a car paint shop. And, of course, he always earned good money. I was the only grandson and always (laughter) got a lot of attention, yes. A moped, then a car at the age of eighteen. Yes, while in my parents' house, money was much tighter. (H_DE, pos. 9)*

His great-grandparents were large landowners, but they sold their estate and traveled around the world.

As a child, even at the age of seven, he was able to earn money with his grandfather and saw what it meant to run his own business:

H *[...] of course, I helped out there often, and then I always got a good salary. For my work when I had time.*

I *What did you do there?*

H *Sanded down cars. Yes. Then he freshly painted it. And before that, the old paint had to come off, yes. With water and sandpaper. It wasn't nice work, but it paid well. Yes. (H_DE, pos. 23–25)*

When he was at school, he was interested in the natural sciences. He often won mathematics and physics Olympiad competitions. But his dream job was that of a chemist:

H Yes, I always wanted to be a chemist. Because my father also taught chemistry as a second subject. At school. And I also had chemistry with my father until eighth grade. And I liked that. As a child, I got the big chemistry kit and was able to do experiments at home. (H_DE, pos. 57)

He was allowed to study chemistry, but the specific field of his doctoral research was determined for him:

H Well, that was the case in the GDR because it was a performance principle. The best in the academic year got an offer. Well, I graduated with a first grade and then got an offer. Anyway, the offer wasn't that great. But I saw it as a challenge. It was in the field of theoretical physics. And as a chemist, you have to catch up on a lot of the basics. (H_DE, pos. 61)

In the GDR, Interviewee H worked for ten years as the research director in a combine that employed 2,000 people.

After the systemic change, a trust took over the management of the combine. The works council was asked to select four people to represent the combine, select new investors, and conduct negotiations. Interviewee H was one of these four people. He traveled through Europe looking for clients and investors for the combine. However, the negotiations and take-over attempts were unsuccessful. He lost his job, and that was the impulse for his first thought about starting his own company:

H I was unemployed then, only for one day, but that annoyed me. Because the Americans then said: "No, we won't take it over. And we don't do synthesis either." Then I thought: well, not then, right? I had another colleague who felt the same way. I was the research director before. And he was when I became managing director, then he took over as research director. He was also of the opinion: "We'll do it ourselves now." (H_DE, pos. 113)

He himself looked for copartners with money in West Germany and founded a five-person company with 50 percent owned by three people from the East, and 50 percent by two people from the West.

To finance their own shares, the shareholders from the East each received DM 20,000 from the Western companies as a ten-year loan. To finance initial production, the company received DM 400,000, but only through contacts of the West German shareholders.

In their initial period of self-employment, they received the greatest support from French clients, selected by Interviewee H himself. The French business partners came on-site and demonstrated how products should be manufactured properly. Despite the complaint, payment for the first order was received in full with no deduction, which was unusual among such firms. Only thanks to this cooperation was it possible to build up the company:

H We had a big contract with the French. [...] They even sent us (.) their team that made the product in Grasse. And they said: "We'll teach you how to do it." They trained our workers then. And in the preparation, in planning, they also gave us important tips, for example, material questions and technical details. That was absolutely cooperative. When the workers were there, it was like that, our people were very surprised that the French asked: "Why did you give up the beautiful GDR?" And the French, they are all a bit on the left down there and were of the opinion: "We have to support it if you here become self-employed." And then it was like that, we had the first appointment when the first delivery was supposed to be, and the system was just finished. We couldn't clean them yet. But they exerted such pressure that we said: "Well, okay, let's go now, shall we?" As a result, the product was dirty. So, there was still dirt in the pipeline and such. We delivered and knew we'd get a slap in the face again. And then the call came: "Well, your product is good." I just sank in the chair. "There's dirt inside. But we'll distil it again, and then we can deliver it, but we'll pay you the full price." That was like Christmas. Because that was a large sum. Then it could go on. And from then on, things actually went well for us, right? For the first two or three years, we only did business with the French. (H_DE, pos. 111)

Interviewee H actually had no intention of becoming self-employed. It was by chance, because of his losing his job, that he came up with the idea. He was active and sought partner companies in West Germany to finance his company. The interviewee has personally applied for nine patents, and the company currently has five or six pending patents. The company, which has 56 employees, generates sales of between €10 million and €25 million, with annual research and development expenditure of around €3 million. It is managed by the son of Interviewee H, while the latter remains the majority shareholder.

6 SUMMARY

Irrespective of entrepreneurial skills, age, level of education, and experience in management positions in the GDR, most of the entrepreneurs surveyed stated that they lacked the necessary business or legal knowledge to run a company in a highly competitive market environment following the systemic change. The technical knowledge that they carried over from the GDR era was sufficient for the interviewees to establish innovative companies.

The way in which entrepreneurs socialized in the old system acquired knowledge of the functioning of the market economy depended more on individual experience and less on age, education, or level of entrepreneurial skills. After the systemic change, people who had contact with business partners from capitalist countries while working in state-owned companies purposefully sought contacts in West Germany or Western Europe (Interviewees I, D, J, H). Support from Western partners mainly related to the transfer of know-how, capital, and goods. Interestingly, it was the East German interviewees who actively looked for potential partners in West Germany, and not vice versa.

Weiss emphasizes that the long-term transfer of knowledge and experience to new contexts requires a high degree of openness, interaction, and trust between the parties involved (Weiss 2009, 36). This was the only way to ensure effective cooperation and a successful transfer of knowledge. In addition to cooperation between eastern and western German companies, education and training also played an important role in knowledge transfer. Here it was fundamental that East German entrepreneurs had access to the latest developments and technologies and were thus able to use and further develop their existing knowledge. Almost all of the interviewed entrepreneurs attended courses on the market economy in the transition phase. Their technical knowledge was already in place. Education and training are crucial factors for the success of knowledge transfer in the transformation process. Only in this way can existing knowledge be put into practice and further developed (Lindner 2010, 44). It cannot be questioned that knowledge transfer was an important factor in the long-term success of innovative companies in East Germany. Through the cooperation between East and West German companies, as well as through education and training, the application of existing knowledge and its further development were made possible. This was crucial to successfully shaping the economic transformation process in East Germany.

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