UNIVERSITY OF WARSAW | FACULTY OF ECONOMIC SCIENCES

WORKING PAPERS
No. 13/2026 (507)

DID LIVING STANDARDS CONVERGE? BEYOND GDP IN POST-SOCIALIST EUROPE AND RUSSIA

MICHAL BRZEZINSKI

WARSAW 2026

ISSN 2957-0506

WORKING PAPERS 13/2026 (507)

Did Living Standards Converge? Beyond GDP in Post-Socialist Europe and Russia

Michal Brzezinski[1*]

[1] *University of Warsaw, Faculty of Economic Sciences*
[*] *Corresponding author: mbrzezinski@wne.uw.edu.pl*

Abstract: Three decades after the fall of communism, GDP convergence is widely cited as evidence that the post-socialist transition succeeded. But GDP is a narrow measure of living standards. This paper asks whether convergence toward Western Europe holds up once health, inequality, and leisure are also taken into account. We construct a comprehensive welfare measure for Poland, Czechia, Hungary, Slovakia, and Russia, benchmarked against Germany, covering the 1980s through 2022. In every country, welfare relative to Germany falls well below what GDP alone would suggest. Russia's welfare stands at roughly half its GDP level, driven by the post-Soviet mortality crisis and extreme inequality—challenging characterisations of Russia as a "normal" middle-income country. Hungary, conventionally grouped with the Visegrad convergence successes, suffers a substantial welfare shortfall driven by decades of poor health outcomes. Poland emerges as the strongest performer in convergence dynamics. Life expectancy is the largest contributor to this gap.

Keywords: welfare measurement, Eastern Europe, Russia, transition economies, living standards, life expectancy, inequality

JEL codes: D63, I31, O57, P36

Acknowledgments: This work is supported by CHANSE and NORFACE [WELLSIM], by the Economic and Social Research Council (ESRC, UK) with grant No UKRI611; Ministerio de Ciencia, Innovación y Universidades (MCIN/AEI, Spain) with grant No PCI2025-163172; National Science Centre (Poland) with project reference No 2024/06/Y/HS4/00029; Swedish Research Council for Health, Working Life and Welfare (FORTE, Sweden) with project No 2023-01709; and Deutsche Forschungsgemeinschaft (DFG, German Research Foundation) with project No 539817120. The author used Claude 4.6 (Anthropic) to assist with language editing and polishing of the manuscript; all substantive content, analysis, and interpretation are solely the author's.

1. Introduction

GDP convergence has become the dominant yardstick for assessing the post-socialist transition. EU accession was justified in part by the economic catch-up of Central Europe; in Hungary and Russia , governments have cited rising GDP as evidence of successful governance and as a source of political legitimacy (Åslund, 2007; Shleifer and Treisman, 2005). By the metric of GDP per capita , the standard narrative is indeed one of convergence —strong in the Visegrad Four , fragile and incomplete in Russia.

But GDP per capita is a narrow measure of living standards. The post-socialist transition reshaped virtually every dimension of well-being: life expectancy collapsed in Russia during the 1990s and stagnated in Hungary for decades (Brainerd and Cutler, 2005; Leon et al., 1997); income and consumption inequality rose sharply, especially in Russia (Novokmet, 2021; Novokmet et al., 2018); labour markets were restructured, altering working hours and leisure (Boeri and Terrell, 2002). These changes are central to how people actually experienced the transition, yet they are invisible in GDP. A parallel literature on subjective well-being has documented a persistent "happiness gap" in post-socialist societies (Easterlin, 2009; Guriev and Zhuravskaya, 2009), suggesting that income-based assessments may significantly overstate welfare improvements.

This paper asks a simple question: *did living standards in post-socialist Europe and Russia actually converge toward Western Europe when we account for health, inequality, and leisure, rather than income alone?* To answer it, we construct a comprehensive welfare measure for Poland, Czechia, Hungary, Slovakia, and Russia, benchmarked against Germany, covering the period from the 1980s through 2022. Our measure follows the framework of Jones and Klenow (2016), which combines consumption, life expectancy, leisure, and consumption inequality into a single index of living standards. The index expresses non-income dimensions in the same units as consumption differences, making trade-offs explicit: a five-year shortfall in life expectancy, for instance, can be compared directly to a 20 percent consumption gap.

The welfare index reveals a picture that differs markedly from the GDP narrative. *In every country, welfare relative to Germany falls well below what GDP per capita would suggest*—the gap is large and persistent. *Cross-country heterogeneity is pronounced*. Russia's welfare level is roughly half of what its GDP per capita would suggest, driven overwhelmingly by low life expectancy and high consumption inequality. Hungary—often grouped with the other Visegrad countries as a convergence success—shows welfare stagnation relative to Germany over much of the period, largely because of persistently poor health outcomes. Poland, by contrast, displays among the most favourable welfare-to-GDP ratios in the sample, consistent with its reputation as the region's strongest performer. And *the decomposition identifies specific channels*: life expectancy is the dominant driver of the welfare–GDP gap in every country, with the penalty largest for Russia and Hungary; inequality plays a secondary but non-negligible role, particularly for Russia.

These findings challenge the dominant narrative of post-socialist convergence. To our knowledge, this is the first systematic application of a comprehensive welfare framework to the post-socialist transition over a period spanning four decades—from the late socialist era through the post-pandemic period. The long time horizon allows us to trace how the welfare–GDP relationship evolved across distinct phases: the initial output collapse, the recovery and EU accession period, the global financial crisis, and the Covid-19 shock. The decomposition identifies which non-income dimensions of well-being matter most, and for which countries, connecting the income-focused convergence literature (Estrin et al., 2001; Rapacki and Próchniak, 2009; Svejnar, 2002) with multidimensional welfare assessments (Grün and Klasen, 2001, 2012), the subjective well-being evidence (Guriev and Melnikov, 2018), and broader evaluations of the transition's human costs (Milanovic, 1998; Pop-Eleches and Tucker, 2017).

2. Background and Context

2.1 GDP per capita convergence to Western Europe

A large literature examines whether post-socialist economies have converged in GDP per capita toward Western European benchmarks (Estrin et al., 2001; Rapacki and Próchniak, 2009; Åslund, 2018; Cieślik and Wciślik, 2020; Eftimoski, 2020).

For Central Europe, the dominant finding is one of substantial but incomplete convergence since the mid-1990s, closely associated with EU accession, foreign direct investment, structural change, and institutional upgrading.[1] Poland is often cited as an exceptionally successful transition case and a prominent example in the convergence literature. Piątkowski (2018) characterises Poland as "Europe's growth champion", emphasising sustained catch-up growth over three decades, resilience to external shocks, and steady improvements in productivity and living standards.

For Russia, the convergence narrative is more contested. Russia experienced a deep transformational recession in the 1990s (Murrell, 1993; Leeson and Trumbull, 2006) followed by rapid catch-up growth between 1999 and 2008, largely driven by stabilisation and favourable commodity prices. However, growth slowed sharply after the global financial crisis and again after 2012. Dąbrowski (2019) argues that demographic headwinds, weak productivity growth, and institutional constraints limit Russia's long-run convergence prospects. Growth-accounting evidence by Voskoboynikov (2017) similarly points to declining total factor productivity and worsening labour reallocation as key drivers of post-crisis stagnation. As a result, Russia's convergence to Western European income levels appears episodic rather than sustained.

2.2 Prior literature on transition performance

This paper relates to a broad literature examining the evolution of living standards in Eastern Europe and the former Soviet Union from the late socialist period through the post-socialist transition. Two strands are particularly relevant: (i) multidimensional approaches to well-being that go beyond GDP, and (ii) evidence on specific components of well-being—income, health, inequality, and working time—during and after socialism.

Multidimensional perspectives on well-being in post-socialist economies

The transition from socialism to market economies was accompanied by sharp and often divergent movements in incomes, health outcomes, inequality, and labour market conditions. Standard GDP-based assessments do not fully capture these trade-offs, motivating multidimensional measures of well-being such as "full income", consumption-equivalent welfare indices, and composite indicators like the Human Development Index (HDI).

Within this tradition, the consumption-equivalent welfare framework developed by Jones and Klenow (2016) provides a coherent theoretical aggregation of consumption, leisure, longevity, and inequality into a single welfare metric. Although most applications focus on advanced economies, the framework is particularly informative in post-socialist contexts, where changes in mortality, inequality, and working time were often as large as, or larger than, changes in GDP per capita. Earlier work by Grün and Klasen (2001, 2012) anticipated this logic by explicitly adjusting income-based comparisons for inequality and non-income dimensions, showing that welfare levels in socialist Eastern Europe were higher than suggested by GDP alone, and that welfare losses during the 1990s transition were much deeper and more persistent once distributional and social indicators were taken into account.

[1] GDP per capita trends for our sample countries are displayed in Figures 1-5 below.

Closely related evidence comes from the subjective well-being literature, which documents a large and persistent "happiness gap" between post-socialist countries and countries at similar income levels elsewhere. Easterlin (2009) and Guriev and Zhuravskaya (2009) show that, even after controlling for income, unemployment, and demographics, individuals in post-socialist societies reported significantly lower life satisfaction for much of the 1990s and 2000s. This gap is commonly interpreted as reflecting institutional disruption, increased inequality, economic insecurity, and the erosion of social safety nets—factors that are not fully captured by income measures alone. More recent work suggests that this gap narrowed or disappeared by the mid-2010s, particularly among younger cohorts (Guriev and Melnikov, 2018), consistent with gradual recovery across multiple well-being dimensions.

Income, consumption, and inequality dynamics

A central dimension of well-being in post-socialist economies is inequality. The most comprehensive long-run evidence on this topic is provided by Novokmet (2021), who reconstructs income inequality trends in Russia, Poland, Czechoslovakia, Hungary, and other former communist countries from the late nineteenth century to the 2010 s. His analysis documents a pronounced U-shaped pattern of income inequality over the twentieth century. Prior to World War II, income and wealth concentration were high, driven largely by capital income. The introduction of communism produced an unprecedented compression of inequality through nationalisation, elimination of private capital income, and strong administrative wage compression. During the mature socialist period, income inequality reached historically minimal levels.

The transition to market economies after 1989 reversed this pattern everywhere, but with striking cross-country heterogeneity. Russia experienced an exceptionally rapid and large increase in income inequality in the early 1990s, with top income shares rising to levels comparable to, or exceeding, those observed in the United States (Novokmet et al., 2018). Central European countries such as Poland, Czechia, and Hungary saw more moderate and gradual increases, stabilising at inequality levels closer to Western Europe. Novokmet (2021) emphasises that these divergent paths reflect institutional and policy choices—particularly privatisation strategies, labour market institutions, and the scale of social transfers—rather than purely economic forces.

While this literature focuses primarily on income inequality, the distinction between income and consumption inequality is central to welfare analysis. The multidimensional well-being measure estimated in this paper relies on consumption inequality, which is more directly linked to utility and material living standards. Under socialism, price controls, rationing, and extensive in-kind provision (Kornai, 1992) likely meant that consumption inequality was even lower than income inequality suggested by wage data. During the transition, income inequality rose sharply, but consumption inequality may have increased less, at least temporarily, due to household smoothing, informal transfers, subsistence production, and residual public provision. At the same time, the collapse of subsidies and public services—especially in Russia—implies that consumption inequality likely rose considerably as well, even if less dramatically than income inequality. For these reasons, income-inequality series such as those documented by Novokmet are best interpreted as a rough guide to the direction and timing of distributional change rather than as direct inputs into consumption-based welfare measures. To the extent that consumption smoothing and residual public provision dampen distributional changes relative to income, the rise in income inequality overstates the deterioration in consumption-relevant welfare; but the collapse of in-kind provision works in the opposite direction, particularly for Russia. Our robustness checks (Section 7) show that the qualitative findings survive alternative inequality sources, though the magnitude of Russia's inequality

penalty is sensitive to the data used.

Health, mortality, and demographic dimensions

Health outcomes constitute another core dimension of well-being in post-socialist societies. Late socialism was characterised by relatively high life expectancy given income levels, reflecting decades of investment in education and basic healthcare, although the Soviet Union experienced stagnating life expectancy and rising adult male mortality from the 1970s onward. The early transition period brought a dramatic deterioration in health outcomes, most notably in Russia, where life expectancy fell sharply in the early 1990s (Brainerd and Cutler, 2005; Leon et al., 1997; Shkolnikov et al., 1998). This mortality crisis has been extensively documented and linked to economic stress, institutional collapse, alcohol consumption, and rapid social change (Brainerd and Cutler, 2005; Leon et al., 1997; Stuckler et al., 2009).

The welfare implications are large. Studies valuing longevity improvements as part of "full income" suggest that mortality changes alone can dominate income movements in welfare accounting. From this perspective, the sharp decline in life expectancy in Russia during the 1990s represents one of the largest welfare losses observed in peacetime economies. Central European countries experienced less severe health shocks and resumed steady improvements in longevity by the late 1990s, contributing to faster recovery in multidimensional well-being.

Working time, labour markets, and leisure

Changes in working time and labour market conditions further differentiate post-socialist welfare trajectories. Socialist economies were characterised by near-universal employment, relatively compressed wages, and, in some cases, shorter working hours. The transition introduced open unemployment, longer or more variable working hours, and greater income risk (Boeri and Terrell, 2002; Lehmann and Muravyev, 2012). From a Jones–Klenow perspective, these changes matter because leisure enters welfare directly and because labour market insecurity can affect consumption smoothing and health. Empirically, Central European countries gradually converged towards Western European labour market patterns, while Russia's adjustment relied more heavily on real wage flexibility and income compression rather than employment losses (Gimpelson, 2018; Gimpelson and Kapeliushnikov, 2011), particularly after the 2008–2009 crisis (Gimpelson and Kapeliushnikov, 2011).

Implications for multidimensional welfare analysis

This literature highlights the need to evaluate post-socialist performance using a multidimensional welfare framework. GDP per capita convergence provides a useful baseline narrative, but it obscures large and persistent differences in inequality, health, and leisure that are central to individual well-being. Income inequality rose sharply after 1990, especially in Russia, but its welfare implications depend critically on how it translated into consumption inequality. Mortality shocks in the early transition years generated welfare losses that dwarf income movements. Differences in labour market adjustment further shape welfare comparisons across countries.

By integrating consumption, longevity, inequality, and leisure, a Jones–Klenow-style measure offers a unified framework for synthesising these insights. It also provides a natural bridge between the income-focused convergence literature, the long-run inequality evidence documented by Novokmet, and broader assessments of social welfare in post-socialist economies.

3. Measuring Living Standards Beyond GDP

We measure living standards using the consumption-equivalent welfare index developed by Jones and Klenow (2016). This section provides an intuitive summary of the framework; the formal derivation and all equations are presented in Appendix Appendix B.

For each country, the welfare index answers the question: *by what factor would German consumption have to be multiplied for Germany to deliver the same overall welfare as the country in question?* The "overall welfare" includes not only consumption but also life expectancy, leisure, and consumption inequality, aggregated through an expected-utility framework. The index makes trade-offs between dimensions explicit and commensurable. A country may have lower GDP per capita than Germany but higher welfare if it has substantially longer life expectancy or more leisure. Conversely, a country that has converged in GDP may still lag in welfare if it suffers from high mortality or high inequality.

In practice, the gap between the welfare index and GDP per capita can be decomposed into four additive components (in logs):

1. **Life expectancy.** Higher life expectancy means more years over which consumption and leisure are enjoyed. The welfare gain from an additional year of life depends on the level of utility in that year—so an extra year matters more in a richer, more equal country.

2. **Consumption share of GDP (C/Y).** Welfare depends on consumption, not output. Countries where a larger share of GDP goes to household consumption score higher, other things equal. Countries with high investment or government spending shares score lower.

3. **Leisure.** The framework treats time not spent working as welfare-enhancing. Countries with shorter working hours per capita enjoy a leisure bonus; countries where people work more hours face a welfare penalty.

4. **Consumption inequality.** Greater inequality in consumption reduces welfare: when consumption is spread more unequally across households, average well-being falls even if total consumption is unchanged. We measure inequality using Gini coefficients, converted to a statistical measure of consumption dispersion under standard distributional assumptions.

We report two types of decomposition. The *level decomposition* (Table 1) shows how much each component contributes to the welfare–GDP gap for a given year. The *growth decomposition* (Table 2) reports welfare and GDP growth rates relative to Germany, so that the decomposition columns show which dimensions drove welfare convergence toward (or divergence from) the benchmark. In both cases, the contributions sum to the total welfare–GDP gap or convergence differential.

3.1 Assumptions and Calibration

The welfare index rests on standard economic assumptions about preferences—diminishing marginal utility of consumption , independent valuation of consumption and leisure , and standard statistical distribution of consumption across households—discussed in detail by Jones and Klenow (2016). The measure is calibrated using their baseline parameter values . The most consequential parameter determines the welfare weight on life expectancy and is calibrated from the value of a statistical life (VSL) literature ; the remaining parameters — governing the responsiveness of labour supply to wages and the disutility of work—are taken from standard labour supply estimates. Because the life-expectancy parameter amplifies the

longevity channel—and life expectancy is the dominant non-income driver in our results—we test sensitivity to all calibration choices in Section 7, varying each parameter by ±25%. The qualitative findings and country rankings are robust to these perturbations.

The welfare formula requires a reference country against which each dimension is compared. Following Jones and Klenow (2016), we use the United States: life expectancy gaps, leisure differences, and inequality are all measured relative to US levels, and consumption is normalised so that US consumption per capita equals one in 2007. We use the US rather than Germany because the preference parameters—especially the weight on life expectancy—were estimated from US data on the value of a statistical life. These parameters and the reference country are linked: the weight that makes the formula match observed willingness to pay for longevity in the US need not be the same weight that would match German willingness-to-pay data. Using the US reference with the US-calibrated parameters keeps the two consistent. In Section 7, we recompute the welfare index using Germany and France as the internal reference and confirm that this choice has negligible effects on the welfare level rankings.

Although the US serves as the internal reference, all results are presented relative to Germany. For the consumption share, leisure, and inequality components, the US normalisation cancels algebraically when taking country-minus-Germany differences. The life-expectancy component retains a dependence on US life expectancy (see Appendix Appendix B), because the valuation of longevity differences is tied to the absolute level of lifetime utility; however, the robustness checks confirm that this does not affect the qualitative results. For the growth decomposition (Table 2), we subtract Germany's growth rates from each country, so that the decomposition columns reflect changes in each country's fundamentals relative to Germany. Appendix Appendix B presents the algebra in full.

4. Data

We analyse five post-socialist countries—Poland, Czechia, Hungary, Slovakia, and Russia—using Germany as the benchmark. The Visegrad Four represent the most commonly studied Central European transition economies and span a range of transition experiences, from Poland's "shock therapy" and sustained catch-up growth (Piątkowski, 2018) to Hungary's more gradual and ultimately less successful trajectory. Russia provides an important contrast: the largest post-Soviet economy, with a qualitatively different transition path marked by deep recession, oligarchic privatisation, and a commodity-dependent recovery. Germany is a natural reference country given its geographic proximity, its role as the main economic partner for Central Europe, and the availability of high-quality data on all four welfare components.

The data are annual, beginning in 1980 where data availability permits and extending through 2022. For each country and year we assemble four building blocks of the welfare index: (i) real consumption per capita; (ii) life expectancy at birth; (iii) hours worked and leisure; and (iv) consumption inequality. The detailed construction of each variable is described in Appendix Appendix A; here we summarise the main sources and the key choices that affect our results.

Consumption and GDP. Real consumption and GDP per capita come from version 11.0 of the Penn World Table (PWT; Feenstra et al., 2015), using the expenditure-side measure of real GDP. All quantities are expressed in international dollars at constant purchasing power parities. We normalise so that US consumption per capita equals one in 2007, following Jones and Klenow (2016). For Germany, PWT reports West German data before 1991 and unified Germany thereafter; the series is spliced using chain-linked PPPs so that the transition is internally consistent, but a level shift at reunification is unavoidable as the East German economy is absorbed into the benchmark. Our robustness checks using the USA and France as alternative

benchmarks—neither of which experienced a comparable structural break—produce nearly identical welfare rankings, indicating that this discontinuity does not drive our results.

Life expectancy. Life expectancy at birth comes from the World Bank's World Development Indicators (World Bank, 2024). Although life expectancy at birth is a summary measure that aggregates mortality across all ages, the large swings observed in our sample—particularly the Russian mortality crisis of the 1990s and Hungary's persistent shortfall—were driven primarily by adult and working-age mortality from cardiovascular disease, alcohol-related causes, and external causes of death (Brainerd and Cutler, 2005; Leon et al., 1997), making life expectancy at birth an informative proxy for the health dimensions most relevant to the post-socialist transition. Because annual series can display short-run volatility—particularly around the Covid-19 pandemic—we smooth life expectancy using a three-year centred moving average at the country level. This procedure has negligible effects on pre-pandemic trends but sharply reduces artificial volatility during 2020–2022. In robustness checks we show that using raw annual life expectancy yields qualitatively similar results.

Hours worked and leisure. Annual hours worked per person combine PWT data on average hours per worker, employment, and population. Several gaps in the PWT series require filling: for Czechia, hours per worker in 1990–1992 are set equal to Slovakia's (the two countries shared a common labour market at the end of the socialist period); for Russia, hours in 1990–1991 are set to the first available observation in 1992; for Poland, missing observations in the 1980s and early 1990s are filled from OECD data and from Kukić (2021). Leisure is defined as the complement of hours worked in a fixed yearly time endowment of 5,840 waking hours (sixteen hours per day).

Consumption inequality. This is the weakest data input. We construct annual consumption Gini series from the World Income Inequality Database (WIID; UNU-WIDER, 2024), supplemented for Germany with household budget survey data from Heinrichs (2016). Where only income Ginis are available, we impute consumption Ginis using the average gap between consumption and income Ginis within each equivalence-scale group—a standard "constant gap" procedure. For the five CEE economies, the constant gaps are estimated from pooled data across all five countries; for Germany and the United States, the gaps are estimated from country-specific data. Pooling across CEE countries increases the number of paired consumption-income observations available for gap estimation; country-specific estimation for Germany and the US is feasible because these countries have more complete WIID coverage . The Gini coefficients are converted to a measure of consumption dispersion under a standard distributional assumption (lognormality). This assumption is standard in the literature but is not directly testable with the aggregate data used here; for Russia , where top incomes may be underreported , the resulting inequality measure likely understates true wel- fare losses , making the inequality penalty in Table 1 a lower bound. The resulting inequality series is subjected to extensive robustness checks using alternative data sources (SWIID; Solt, 2020) and alternative treatments of the consumption–income gap (Section 7). For Russia, we restrict WIID consumption Gini estimates to those from the Poverty and Inequality Platform (PIP), which are based on nationally representative survey data ; alternative WIID sources for Russian consumption inequality are excluded due to incomplete coverage of top incomes.

5. Results

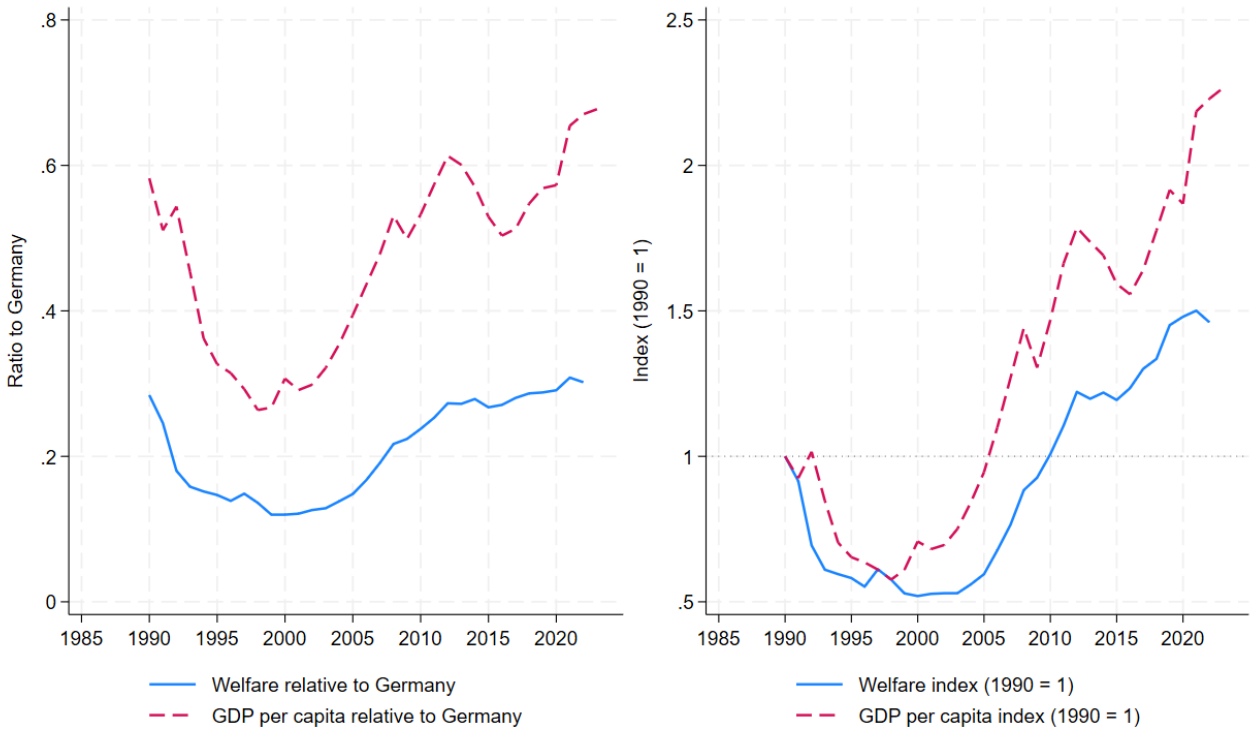
5.1 Welfare versus GDP Trajectories

Figures 1–5 display the central result of the paper. For each country, the left panel plots the ratio of welfare (λ) and GDP per capita to Germany over time; the right panel indexes both series to a country-specific base year (1989 for Hungary and Poland, 1990 for Czechia, Slo-

vakia, and Russia) to facilitate within-country comparisons. A persistent gap between the two lines—with welfare below GDP—indicates that non-income dimensions of well-being pull living standards further from the German benchmark than output alone would suggest. Because PWT reports West German data before 1991 and unified Germany thereafter (see Section 4), the switch from West to unified Germany in 1991 lowers the denominator, mechanically raising all country ratios from that year onward and creating a comparability break at reunification that complicates year-on-year readings across the 1990–1991 boundary. The right panels, which index each country's own series, are unaffected. In the discussion below, we focus on 2019 endpoints and describe trajectories from the post-reunification period to avoid conflating the German structural break with transition dynamics.

Russia. The welfare–GDP divergence is most dramatic for Russia (Figure 1). In 2019, Russia's GDP per capita stood at roughly 57 percent of Germany's, but its consumption-equivalent welfare was only about 29 percent—a gap of nearly half. The right panel shows that while GDP per capita nearly doubled between 1990 and 2019, welfare grew by only about 45 percent. The welfare series displays a deep trough in the mid-to-late 1990s, driven by the well-documented mortality crisis (Brainerd and Cutler, 2005; Shkolnikov et al., 1998) and the sharp rise in consumption inequality during "shock therapy" and mass privatisation (Murrell, 1993; Novokmet et al., 2018). Recovery since the early 2000s has been substantial but incomplete: by 2019, Russia's welfare relative to Germany had barely returned to its late-Soviet level.

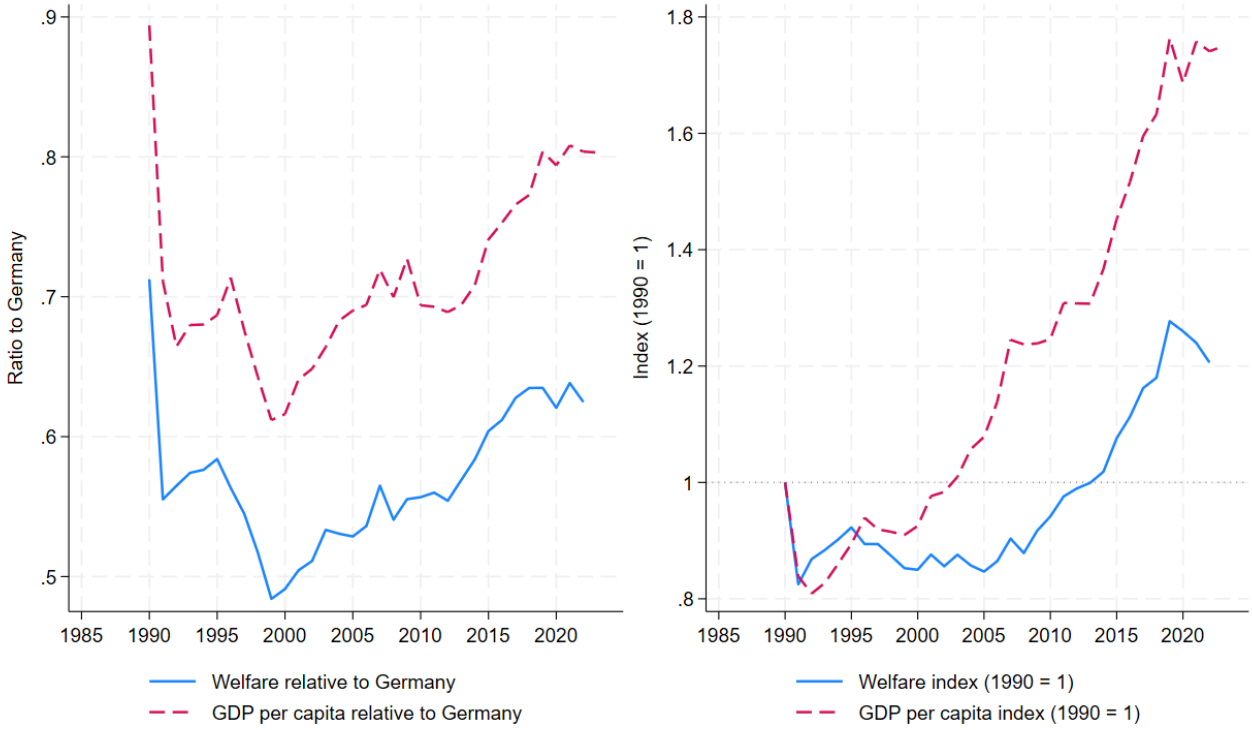
Figure 1: Russia: welfare and GDP per capita relative to Germany



Note: The left panel shows the ratio of Russia's consumption-equivalent welfare (λ) and GDP per capita to Germany's, respectively. The right panel indexes both series to 1990 = 1. Welfare is computed using the Jones–Klenow macro specification, combining consumption per capita, life expectancy, leisure, and consumption inequality. Consumption and GDP are from PWT 11.0; life expectancy from the World Bank (smoothed with a three-year centred moving average); consumption inequality from the WIID. See Appendix Appendix A for details on data construction.

Czechia. Among the Visegrad countries, Czechia has the highest welfare level relative to Germany (Figure 2). By 2019, GDP per capita stood at about 80 percent of Germany's, while welfare reached only 64 percent. The right panel shows that both GDP and welfare recovered strongly from the transition recession of the early 1990s, with GDP growing somewhat faster than welfare over the full period. The welfare gap reflects Czechia's lower life expectancy (78.8 versus 81.1 years in 2019) and, to a lesser extent, longer working hours (909 versus 748 annual hours per capita), which imply less leisure.

Figure 2: Czechia: welfare and GDP per capita relative to Germany

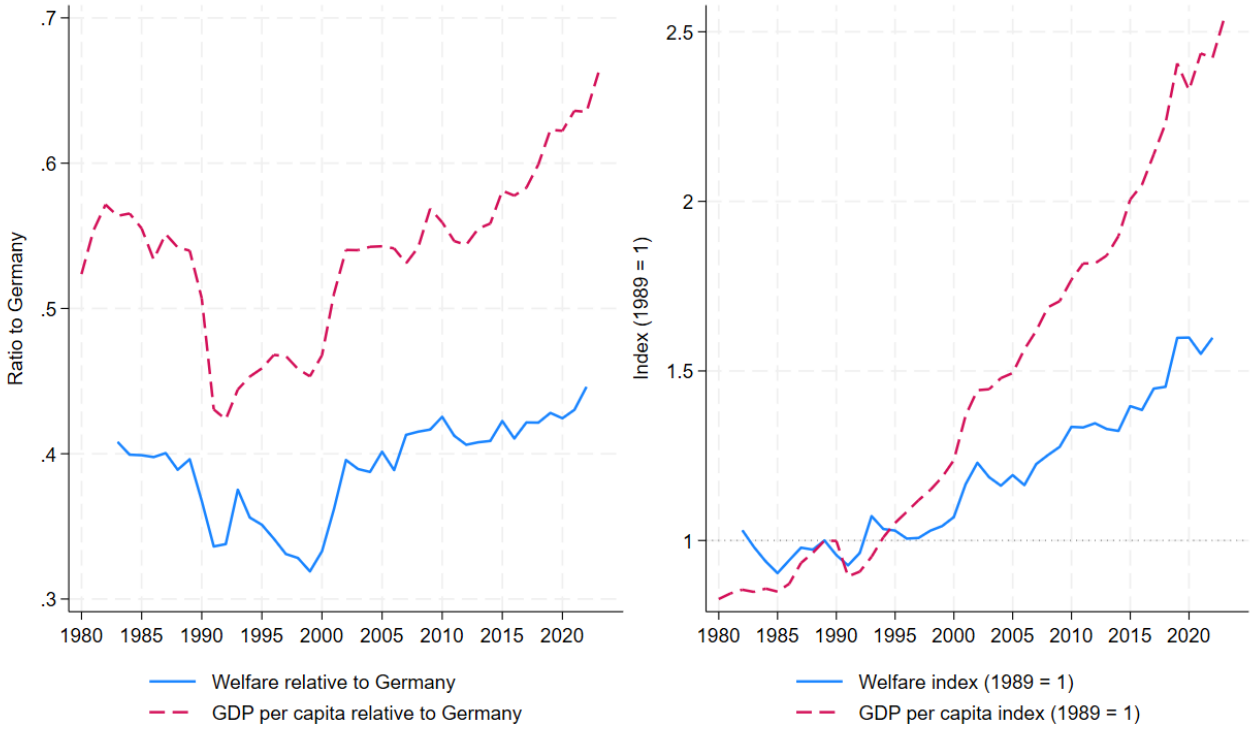


Note: The left panel shows the ratio of Czechia's consumption-equivalent welfare (λ) and GDP per capita to Germany's, respectively. The right panel indexes both series to 1990 = 1. See Figure 1 for a description of the welfare measure and data sources.

Hungary. Hungary presents the most striking case (Figure 3). GDP per capita converged steadily, rising from an early-1990s trough of about 43 percent of Germany's to 62 percent by 2019. Yet welfare tells a very different story. The welfare ratio fell sharply in the early 1990s and recovered only sluggishly, remaining around 43 percent of Germany's in 2019—barely above its pre-transition level of roughly 40 percent in the late 1980s. Hungary's welfare stagnation is driven largely by poor health outcomes: life expectancy in 2019 was only 75.9 years, the lowest among the Visegrad countries and more than five years below Germany's. This persistent mortality gap, rooted in cardiovascular disease, alcohol-related conditions, and underperforming healthcare, imposes a welfare penalty that offsets much of Hungary's income convergence.

Poland. Poland is widely regarded as the most successful transition economy (Piątkowski, 2018), and the welfare data broadly support this assessment (Figure 4). GDP per capita rose from about 31 percent of Germany's in the early 1980s to about 68 percent by 2022—more than a doubling of relative income. Welfare convergence was slower (from roughly 30 to 55 percent), but the welfare-to-GDP ratio is among the most favourable in the sample. Poland

Figure 3: Hungary: welfare and GDP per capita relative to Germany



Note: The left panel shows the ratio of Hungary's consumption-equivalent welfare (λ) and GDP per capita to Germany's, respectively. The right panel indexes both series to 1989 = 1. See Figure 1 for a description of the welfare measure and data sources.

benefits from a relatively high consumption share of GDP (0.766 versus 0.708 in Germany), which partially offsets the drag from lower life expectancy and slightly higher inequality.

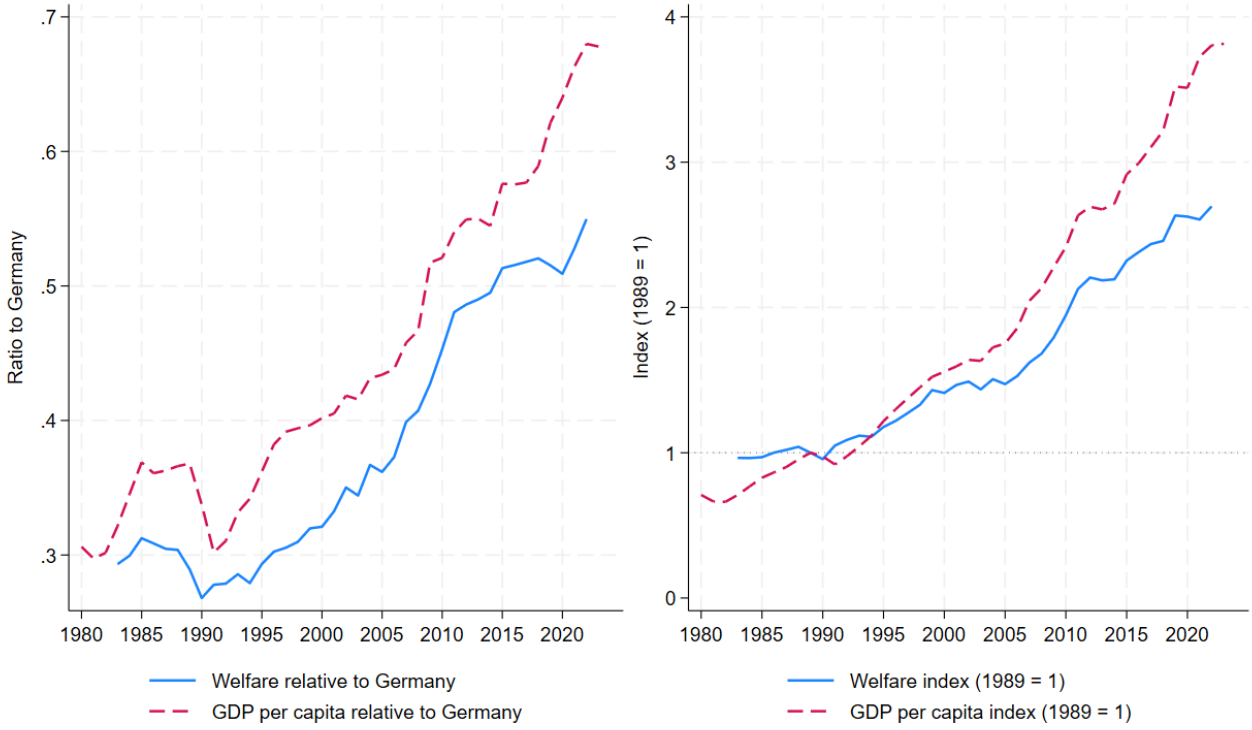
Slovakia. Slovakia's trajectory resembles a compressed version of Czechia's (Figure 5), starting from a lower base. By 2019, GDP per capita stood at about 55 percent of Germany's, while welfare was roughly 46 percent. The right panel shows that both GDP and welfare grew considerably in absolute terms, but Germany grew as well, leaving Slovakia's relative position largely unchanged from the post-reunification starting point. Slovakia's relatively low inequality (a standard deviation of log consumption of 0.387, the lowest in the sample) provides a modest welfare boost, but this is offset by lower life expectancy and a declining consumption share of GDP.

5.2 Decomposition: Levels

Table 1 decomposes the welfare–GDP gap for each country in 2019 into contributions from life expectancy, the consumption share of GDP (C/Y), leisure, and consumption inequality (see Appendix Appendix B for the decomposition formulas). The column $\log(\lambda/\tilde{y})$ measures the gap between welfare and income; negative values mean welfare falls short of what income alone would predict. The format follows Jones and Klenow (2016), Table 7. The second line for each country reports the raw data underlying the decomposition.

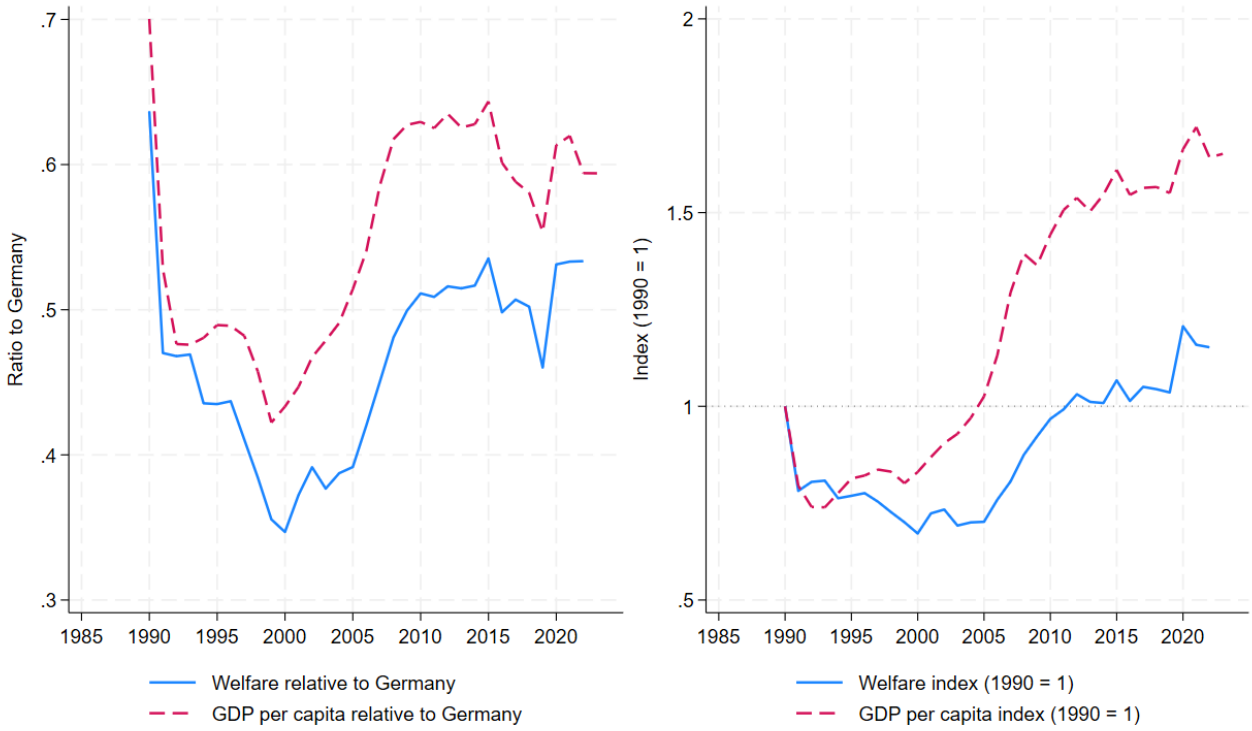
Life expectancy is the dominant channel. For every country in our sample, the life-expectancy term is the largest contributor to the welfare–GDP gap. The effect is enormous for Russia (equivalent to roughly a 39 percent welfare penalty) and large for Hungary (roughly 26 percent), Poland (21 percent), and Slovakia (21 percent). Even Czechia, the best-performing country on this dimension, suffers a non-trivial penalty (13 percent) from its 2.3-year life

Figure 4: Poland: welfare and GDP per capita relative to Germany



Note: The left panel shows the ratio of Poland's consumption-equivalent welfare (λ) and GDP per capita to Germany's, respectively. The right panel indexes both series to 1989 = 1. See Figure 1 for a description of the welfare measure and data sources.

Figure 5: Slovakia: welfare and GDP per capita relative to Germany



Note: The left panel shows the ratio of Slovakia's consumption-equivalent welfare (λ) and GDP per capita to Germany's, respectively. The right panel indexes both series to 1990 = 1. See Figure 1 for a description of the welfare measure and data sources.

Table 1: Multidimensional well-being in post-socialist countries and its decomposition, 2019

Country	Welfare	GDP p.c.	$\log(\lambda/\tilde{y})$	Decomposition			
				Life expectancy	C/Y	Leisure	Inequality
Germany	100.0	100.0	0.000	0.000 (81.1)	0.000 (0.708)	0.000 (748)	0.000 (0.476)
Czechia	63.5	80.4	−0.236	−0.142 (78.8)	−0.067 (0.662)	−0.056 (909)	0.029 (0.410)
Hungary	42.8	62.3	−0.375	−0.304 (75.9)	−0.041 (0.679)	−0.026 (826)	−0.004 (0.484)
Poland	51.5	62.1	−0.187	−0.230 (77.3)	0.079 (0.766)	−0.015 (793)	−0.021 (0.518)
Russia	28.8	56.9	−0.681	−0.486 (72.4)	0.030 (0.729)	−0.096 (1011)	−0.129 (0.696)
Slovakia	46.0	55.4	−0.185	−0.231 (77.3)	0.013 (0.717)	−0.005 (764)	0.038 (0.387)

Notes: Welfare and GDP per capita are expressed as percentages of Germany. The column $\log(\lambda/\tilde{y})$ is the log ratio of welfare to GDP per capita, both measured relative to Germany. The decomposition columns show how each dimension contributes to the gap between welfare and income: a negative value means the dimension reduces welfare relative to what GDP alone would predict, and a positive value means it raises welfare. Values in parentheses are the underlying data: life expectancy (years), consumption share of GDP (C/Y), annual hours worked per capita, and the standard deviation of log consumption.

expectancy shortfall relative to Germany.

Consumption inequality matters for Russia. Russia's consumption inequality is far higher than Germany's, generating a welfare penalty equivalent to roughly 12 percent of consumption. By contrast, inequality contributes modestly or even positively for the Visegrad countries: Slovakia and Czechia have *lower* consumption inequality than Germany, yielding small welfare bonuses.

The consumption share of GDP helps Poland. Poland's consumption-to-GDP ratio of 0.766 exceeds Germany's 0.708, adding roughly 8 percent to Poland's welfare position—the only large positive contribution in the table. This reflects Poland's relatively low investment share and high household consumption, which boosts welfare because the index depends on consumption rather than output.

Leisure effects are secondary. Hours worked per capita are higher in Czechia (909) and Russia (1,011) than in Germany (748), generating modest welfare penalties through the leisure channel. Poland, Hungary, and Slovakia are closer to Germany on this dimension.

5.3 Decomposition: Growth

Table 2 presents the growth decomposition for 1990–2019, with all entries expressed relative to Germany (see Appendix Appendix B for the decomposition formulas and the rebasing algebra). For each country, it reports the difference from Germany in welfare growth (Δg_λ) and GDP growth (Δg_y), along with the convergence gap $\Delta(g_\lambda - g_y)$. A positive convergence gap means that the country's welfare converged toward Germany faster than its GDP; a negative value means welfare convergence lagged behind GDP convergence. Note that a positive convergence gap does not imply that a country's welfare grew faster than its GDP in absolute terms. In every country—including Poland—GDP grew faster than welfare; what differs across countries is the *size* of that gap relative to Germany's own welfare–GDP shortfall.

Poland and Russia are the only countries with positive convergence gaps, meaning their welfare converged toward Germany faster than their GDP did. For Poland (+0.15 pp/year),

Table 2: Welfare convergence to Germany and its decomposition, 1990–2019

	Welfare	GDP p.c.	Convergence	Decomposition of convergence gap			
Country	Δg_λ	Δg_y	$\Delta(g_\lambda - g_y)$	Life expectancy	C/Y	Leisure	Inequality
Czechia	−0.40	−0.37	−0.03	0.17	−0.29	0.02	0.08
				71.7, 78.8	*0.726, 0.662*	*957, 909*	*0.364, 0.410*
Hungary	0.53	0.71	−0.18	−0.12	−0.22	0.08	0.07
				69.4, 75.9	*0.728, 0.679*	*926, 826*	*0.444, 0.484*
Poland	2.25	2.10	0.15	−0.18	0.29	−0.09	0.13
				70.8, 77.3	*0.709, 0.766*	*754, 793*	*0.513, 0.518*
Russia	0.04	−0.08	0.12	−0.73	0.97	0.20	−0.31
				68.8, 72.4	*0.555, 0.729*	*1172, 1011*	*0.471, 0.696*
Slovakia	−1.12	−0.81	−0.31	−0.02	−0.40	0.05	0.06
				70.9, 77.3	*0.811, 0.717*	*847, 764*	*0.326, 0.387*

Notes: All entries are average annual growth rates (percentage points per year) minus the corresponding German value. Δg_λ is welfare growth relative to Germany; Δg_y is GDP per capita growth relative to Germany. The convergence gap $\Delta(g_\lambda - g_y)$ shows how much faster (positive) or slower (negative) each country's welfare-income wedge closed compared to Germany 's. The decomposition columns show the contribution of each dimension . A positive value indicates that the dimension contributed to welfare convergence relative to GDP convergence . The second line reports raw data for 1990 and 2019: life expectancy (years), C/Y, annual hours worked per capita, and the standard deviation of log consumption.

the consumption share of GDP drove much of this advantage (+0.29): Polish households consumed a rising share of national output, while Germany's consumption share was essentially flat. Russia's positive gap (+0.12) reflects very different forces. Russia's consumption share improved dramatically relative to Germany (+0.97), reflecting the recovery of household consumption from the collapse of the early 1990s (C/Y rose from 0.555 to 0.729). Yet this gain was nearly cancelled by devastating losses on life expectancy (−0.73) and rising inequality (−0.31).

The remaining three countries saw welfare fall further behind GDP relative to Germany. Slovakia experienced the largest shortfall (−0.31 pp/year), driven by a declining consumption share (−0.40) as investment-led growth diverted output away from households. Hungary (−0.18) is notable because life expectancy actually *reduced* welfare convergence (−0.12): Hungary's gain from 69.4 to 75.9 years was slower than Germany's improvement. Life expectancy contributions are also negative for Poland (−0.18) and Slovakia (−0.02); only Czechia (+0.17) saw life expectancy gains that outpaced Germany's. Czechia was roughly neutral (−0.03), with a small life expectancy advantage (+0.17) largely offset by a declining consumption share (−0.29).

The inequality channel matters primarily for Russia, where rising consumption dispersion reduced welfare convergence by −0.31 percentage points per year relative to Germany. For the Visegrad countries, inequality effects are small and, in most cases, slightly positive—reflecting that inequality rose less than in Germany.

6. Discussion

GDP per capita convergence provides a systematically misleading picture of how living standards in post-socialist countries evolved relative to Western Europe. The welfare decomposition reveals hidden costs in the transition recession, sharp heterogeneity among the Visegrad countries, patterns consistent with the subjective well-being literature, and concrete implications for policy.

6.1 The Transition Recession in Welfare Terms

The early 1990s brought sharp output declines across all five countries, widely described as the "transition recession" (Murrell, 1993). The debate over whether rapid "shock therapy" or gradualism was the right approach dominated the political economy of transition for a decade (Åslund, 2007; Svejnar, 2002). That debate was conducted almost entirely in GDP terms: countries that recovered faster were judged more successful. Our welfare measure suggests that this framing missed much of the story. The true costs of the transition were substantially larger and more persistent than GDP alone indicates, because the same reform strategies that restored output also reshaped health systems, labour markets, and the distribution of income in ways that had lasting welfare consequences.

A caveat applies to all comparisons spanning the 1990 divide. Under socialism, price controls, rationing, and extensive in-kind provision meant that official real consumption did not map to utility in the same way as post-1990 market consumption (Kornai, 1992). PWT constructs comparable expenditure-side national accounts (Heston, 1994), but converting socialist-era output into internationally comparable measures remains problematic (Marer, 1985; Bergson, 1997; Maddison, 1998). The pre-1990 welfare levels in our figures should therefore be interpreted with caution: late-socialist welfare may be overstated (if official consumption included goods at administered prices that did not reflect scarcity) or understated (if in-kind provision and job security provided welfare not captured in expenditure data). This comparability problem is common to all long-run studies of transition economies and does not affect the post-1990 decompositions that form the core of our analysis.

For Russia, the welfare trough was deeper and longer-lasting than the output trough. GDP per capita relative to Germany bottomed out around 1998 and recovered strongly during the commodity-driven 2000s. Welfare, by contrast, continued to decline relative to Germany into the late 1990s and recovered far more slowly: by 2019, Russia's welfare ratio had barely returned to its late-Soviet starting point. The additional welfare cost came above all from the mortality crisis—life expectancy fell from 68.8 years in 1990 to a nadir of roughly 64 years in the mid-1990s—and from the explosion of consumption inequality during mass privatisation (Novokmet et al., 2018; Hamm et al., 2012). Shleifer and Treisman (2005) famously argued that by the early 2000s Russia had become a "normal" middle-income country—that its economic performance, political institutions, and social indicators, while imperfect, were typical of countries at similar income levels. Their argument rested centrally on GDP-based comparisons. Our results challenge this thesis by applying a welfare measure that incorporates precisely the non-income dimensions that Shleifer and Treisman (2005) treated as secondary. When health and inequality are accounted for alongside income, Russia's welfare falls far below its GDP-implied level, because the post-Soviet mortality crisis and the explosion of inequality offset much of the income recovery . In welfare terms , Russia 's transition was not a V-shaped recession and recovery but rather a protracted crisis with incomplete recovery.

The Visegrad countries experienced milder transition recessions in GDP terms, but their welfare trajectories also reveal hidden costs. Hungary's welfare ratio fell sharply in the early 1990 s and , unlike its GDP ratio , never fully recovered relative to Germany . The welfare penalty came not from inequality (which rose only modestly) but from persistently poor health out- comes that predated the transition and were never adequately addressed.

6.2 Heterogeneity within Central Europe

The Visegrad group—often treated as a homogeneous bloc in the convergence literature—displays substantial heterogeneity in welfare performance. Poland achieved welfare convergence that outpaced its GDP convergence toward Germany, driven by a rising consumption share. Slovakia's welfare ratio to Germany was essentially flat over the period, and its GDP

convergence was not accompanied by comparable welfare gains. Czechia converged on both dimensions but with a persistent welfare gap driven by lower life expectancy and longer working hours. Hungary stands out as the clear underperformer: its GDP convergence masks welfare stagnation.

The Hungarian case deserves emphasis. Hungary's life expectancy of 75.9 years in 2019 was the lowest among the Visegrad countries, generating a welfare penalty equivalent to roughly 26 percent of consumption—larger than the combined effects of all other components. This reflects decades of elevated mortality from cardiovascular disease, cancer, and alcohol-related causes—a pattern that has been widely documented in the public health literature but is typically absent from economic assessments of transition performance. Our welfare measure makes this cost visible and commensurable with income differences: Hungary's health deficit alone is equivalent to roughly a 26 percent reduction in consumption relative to Germany.

Poland's favourable performance, by contrast, reflects not only strong GDP growth but also a high consumption share of GDP. Polish households consume a larger share of national output than their counterparts in the other Visegrad countries, which translates directly into higher welfare. Whether this reflects lower investment rates (with potential costs for future growth), differences in government consumption, or other structural factors is an important question that our framework identifies but does not resolve. The "Visegrad convergence" narrative—which treats the four countries as a homogeneous success story—obscures welfare trajectories that diverge sharply once health and distribution are taken into account.

6.3 Connections to the Subjective Well-Being Literature

The patterns documented here are broadly consistent with findings from the subjective well-being literature. Easterlin (2009) and Guriev and Zhuravskaya (2009) documented a persistent "happiness gap" in post-socialist countries—lower life satisfaction than predicted by income levels—particularly during the 1990s and 2000s. Our welfare index provides a structural, theory-based counterpart to this finding: the gap between welfare and GDP per capita in our data mirrors the happiness gap in survey data.

The parallel extends to the temporal pattern. Guriev and Melnikov (2018) show that the happiness gap had largely closed by the mid-2010s, especially among younger cohorts. Our welfare series for Poland—the Visegrad country where the happiness gap closed most convincingly—also show a narrowing welfare–GDP gap over time, driven by a rising consumption share and stabilising inequality. For the remaining Visegrad countries, the welfare–GDP gap relative to Germany remained stable or widened slightly over the full 1990–2019 period, though improvements are visible in the later sub-period as life expectancy gains accelerated and inequality stabilised. For Russia, however, both the happiness gap and the welfare–GDP gap remain large, suggesting that the factors driving low well-being—mortality, inequality, economic insecurity—have not been fully resolved.

This convergence between two very different approaches—one based on survey responses, the other on theory and macro data—strengthens confidence in both. The welfare index gives the happiness gap a structural interpretation: post-socialist populations were less satisfied than their incomes would predict because their health, leisure, and inequality outcomes were worse than in comparator countries.

6.4 Policy Implications

The decomposition identifies which dimensions of well-being account for the largest welfare shortfalls. It does not, by itself, establish causal policy effects—a deterministic accounting exercise lacks the counterfactual apparatus to rank policy returns. Nonetheless, the magnitudes

suggest where the largest potential welfare gains lie.

The dominant finding is that *health shortfalls account for the largest share of the welfare–GDP gap* in every country in our sample. The magnitudes are large: Hungary's life expectancy shortfall relative to Germany reduces welfare by the equivalent of 26 percent of consumption (a log penalty of −0.304); equivalently, closing this gap would require a compensating consumption increase of about 36 percent—far more than any plausible short-run GDP acceleration could deliver. Investments in cardiovascular prevention, alcohol policy, and primary healthcare could therefore yield welfare gains that are invisible in GDP statistics.

On the distributional side, *inequality matters, but mainly for Russia.* The inequality channel is the second-largest welfare penalty for Russia (equivalent to roughly 12 percent of consumption) but is modest or even positive for the Visegrad countries. The distributional consequences of transition were qualitatively different in Russia—driven by oligarchic concentration of wealth and the collapse of social transfers—and that addressing inequality is a more urgent welfare priority there than in Central Europe.

The consumption share of GDP also has a direct welfare payoff. Countries with high investment rates and low consumption shares may be building future productive capacity, but their current welfare is lower than GDP suggests. Poland's high C/Y ratio is a welfare advantage; Slovakia's declining C/Y is a welfare cost. Policymakers evaluating growth strategies should recognise that not all GDP growth is equally welfare-enhancing: growth that raises household consumption delivers more immediate welfare gains than growth driven by investment or government spending.

More broadly, our findings expose the political uses and limitations of GDP as a measure of national performance. Governments throughout the region have cited GDP growth as evidence of successful governance—a practice that our results suggest is misleading. In Russia, the commodity-driven GDP recovery of the 2000s underpinned claims that the country had become "normal" for its income level (Shleifer and Treisman, 2005), yet welfare lagged far behind income. In Hungary, continued GDP convergence toward Western Europe coexists with welfare stagnation, raising questions about whether rising national income translates into improved living standards when health systems deteriorate. These gaps between GDP and welfare are not merely technical curiosities; they bear directly on how citizens evaluate their governments and on the legitimacy of the post-socialist political order (Pop-Eleches and Tucker, 2017).

7. Robustness

We examine the sensitivity of both the welfare level (Table 3) and the welfare–GDP growth gap (Table 4) to alternative specifications, varying one dimension at a time: the calibrated preference parameters (the life-expectancy weight and the leisure disutility parameter); the inequality data source; the internal reference country used in the Jones–Klenow formula; life expectancy smoothing; and the sample period.

The results are most sensitive to the life-expectancy weight, calibrated from the value of a statistical life. Varying this parameter by ±25% shifts Russia's welfare ratio between 24.9% and 33.3% of Germany (baseline: 28.8%), with comparable ranges for other countries. This sensitivity is intuitive: the parameter determines how heavily life expectancy differences weigh in the welfare index, and life expectancy is the dominant non-income driver. In contrast, varying the leisure disutility parameter by ±25% changes welfare ratios by less than 1 percentage point from the baseline for each country.

The choice of inequality data primarily affects Russia. The SWIID specification replaces our baseline WIID consumption Gini series with SWIID disposable income Gini, converted

Table 3: Robustness of multidimensional well-being, 2019

Specification	Czechia	Hungary	Poland	Russia	Slovakia
Baseline	63.5	42.8	51.5	28.8	46.0
Reference: Germany†	63.9	43.1	51.8	28.9	46.5
Reference: France†	64.2	43.5	52.3	29.3	47.0
SWIID inequality	63.7	43.5	53.0	32.1	46.1
No inequality (σ^2=0)	61.5	42.7	52.3	32.0	44.1
$\bar{u}$ −25%	65.9	46.7	54.9	33.3	49.1
$\bar{u}$ +25%	61.1	39.3	48.4	24.9	43.2
θ −25%	64.3	43.0	51.6	29.3	46.0
θ +25%	62.7	42.6	51.4	28.2	46.0
Unsmoothed life expectancy	64.4	43.4	52.9	29.8	46.7

Notes: Welfare measured as consumption-equivalent (λ), expressed as percentage of Germany (= 100). Baseline parameters: $\bar{u} = 5.2325$, $\theta = 14.2$, $\varepsilon = 1$. The baseline uses the US as the internal reference country in the Jones–Klenow formula (consumption normalisation, life expectancy differences, leisure and inequality gaps are all measured relative to the US). † These specifications recompute the welfare index using Germany or France as the internal reference, so that all utility comparisons are made relative to that country. SWIID specification uses disposable income Gini converted to consumption inequality via $\sigma_c^2 = \kappa\sigma_y^2$ with $\kappa = 0.6$. France reference uses SWIID-derived consumption inequality for France (WIID consumption Gini unavailable).

Table 4: Robustness of the welfare–GDP growth gap, 1990–2019

Specification	Czechia	Hungary	Poland	Russia	Slovakia
Baseline	−1.11	−1.27	−0.93	−0.96	−1.39
Reference: Germany†	−2.27	−2.38	−2.08	−2.07	−2.52
Reference: France†	−2.00	−2.13	−1.86	−1.83	−2.24
SWIID inequality	−1.04	−1.20	−0.94	−0.60	−1.32
No inequality (σ^2=0)	−1.10	−1.25	−0.96	−0.59	−1.37
$\bar{u}$ −25%	−1.37	−1.49	−1.15	−1.01	−1.60
$\bar{u}$ +25%	−0.86	−1.04	−0.72	−0.91	−1.19
θ −25%	−1.11	−1.28	−0.91	−1.01	−1.40
θ +25%	−1.11	−1.25	−0.96	−0.91	−1.38
Unsmoothed life expectancy	−1.11	−1.30	−0.95	−0.94	−1.43
Period: 1990–2022	−1.15	−1.17	−1.01	−1.32	−1.11

Notes: Welfare–GDP growth gap ($g_\lambda - g_y$) in percentage points per year. Negative values indicate that welfare grew more slowly than GDP per capita under the given specification. The baseline uses the US as the internal reference country in the Jones–Klenow formula. † These specifications recompute the welfare index using Germany or France as the internal reference, so that all utility comparisons are made relative to that country; growth gaps widen because Germany and France had faster life expectancy gains than the US over this period. Last row extends the sample to 2022.

to consumption inequality using the ratio of consumption to income inequality estimated by Blundell et al. (2008). This raises Russia's welfare ratio from 28.8% to 32.1%; eliminating the inequality channel entirely yields a nearly identical result (32.0%). The similarity between these two figures indicates that, under the SWIID-to-consumption conversion, Russia's consumption inequality relative to Germany is close to zero—that is, the SWIID-based measure largely eliminates Russia's inequality penalty rather than confirming its magnitude. What remains robust across all inequality treatments is that inequality sensitivity is concentrated in Russia: for the Visegrad countries, alternative inequality measures change welfare ratios by at most 2 percentage points.

As discussed in Section 3, the baseline uses the US as the internal reference country because the preference parameters were calibrated from US data. To test whether this choice drives the results, we recompute the welfare index from scratch using Germany or France as the internal reference, so that all utility comparisons are made relative to that country rather than the US. The welfare level rankings are essentially unchanged: Russia's welfare stands at 28.9% of Germany under the German reference and 29.3% under the French reference, compared with 28.8% at baseline (Table 3). The growth gaps widen in magnitude—roughly doubling under the German or French reference—because life expectancy improved faster in Germany and France than in the US over this period, producing larger health penalties for transition countries. The qualitative conclusion (all gaps negative, rankings preserved) is unaffected. Using unsmoothed life expectancy has negligible effects. Extending the sample to 2022 introduces the Covid-19 mortality shock, which widens Russia's absolute welfare–GDP growth gap from −0.96 to −1.32 percentage points per year (Table 4).

Table 5 examines sensitivity to the starting year by replicating Table 2 over 1991–2019, so that both endpoints use unified Germany as the denominator. This addresses the concern that the 1990 starting point conflates the first year of the transition recession with the PWT's switch from West to unified German data. For Russia and Slovakia, the results are stable: convergence gaps have the same sign and similar magnitudes (+0.12 to +0.18 for Russia, −0.31 to −0.25 for Slovakia). Czechia's convergence gap is close to zero under both starting years and flips sign (from −0.03 to +0.04), a difference too small to be economically meaningful. Hungary's gap widens from −0.18 to −0.46, driven by a large drop in the C/Y channel (−0.22 to −0.57): Hungary's consumption share of GDP jumped from 0.728 in 1990 to 0.795 in 1991, so starting from the higher 1991 level amplifies the measured decline to the 2019 endpoint (0.679). Poland is the most sensitive to the starting year. Its convergence gap reverses from +0.15 (1990–2019) to −0.37 (1991–2019), driven entirely by the consumption share channel: Poland's C/Y jumped from 0.709 to 0.818 between 1990 and 1991 as the Balcerowicz reforms liberalised prices, then declined to 0.766 by 2019. With the 1990 start, C/Y contributes +0.29; with the 1991 start, −0.24. This sensitivity highlights that Poland's and Hungary's convergence gaps in Table 2 are partly shaped by the inclusion of the first year of price liberalisation, when consumption shares shifted sharply.

The qualitative findings hold across all specifications. Russia's welfare consistently stands at 25–33% of the benchmark country, well below what its GDP per capita would imply. The absolute welfare–GDP growth gap (Table 4) is negative for all countries in every specification, confirming that welfare grew more slowly than GDP regardless of parameter choices. The welfare level rankings (Table 3) are unchanged across all specifications.

8. Conclusion

The standard narrative of post-socialist convergence—strong in the Visegrad Four, incomplete in Russia—rests almost entirely on GDP per capita. When we measure living standards com-

Table 5: Welfare convergence to Germany and its decomposition, 1991–2019 (robustness)

	Welfare	GDP p.c.	Convergence	Decomposition of convergence gap			
Country	Δg_λ	Δg_y	$\Delta(g_\lambda - g_y)$	Life expectancy	C/Y	Leisure	Inequality
Czechia	0.48	0.44	0.04	0.14 *71.9, 78.8*	−0.27 *0.714, 0.662*	0.02 *933, 909*	0.15 *0.403, 0.410*
Hungary	0.86	1.32	−0.46	−0.08 *69.3, 75.9*	−0.57 *0.795, 0.679*	0.04 *862, 826*	0.15 *0.480, 0.484*
Poland	2.21	2.58	−0.37	−0.13 *70.9, 77.3*	−0.24 *0.818, 0.766*	−0.09 *719, 793*	0.09 *0.483, 0.518*
Russia	0.57	0.38	0.18	−0.63 *68.1, 72.4*	0.88 *0.569, 0.729*	0.21 *1145, 1011*	−0.28 *0.491, 0.696*
Slovakia	−0.08	0.17	−0.25	−0.08 *71.2, 77.3*	−0.25 *0.769, 0.717*	0.01 *781, 764*	0.08 *0.326, 0.387*

Notes: This table replicates Table 2 using 1991 as the starting year, so that both endpoints use unified Germany as the denominator. All entries are average annual growth rates (percentage points per year) minus the corresponding German value. See Table 2 for variable definitions.

prehensively, accounting for health, inequality, and leisure alongside income, that narrative changes markedly. Among the Visegrad countries, only Poland achieved welfare convergence that outpaced GDP convergence toward Germany; in most countries, welfare lagged behind income. Russia's welfare has not kept pace with its GDP recovery. Hungary's GDP catch-up coexists with welfare stagnation. And across the region, life expectancy accounts for the largest share of the welfare–GDP divergence.

These results carry two broader implications. The first concerns how we evaluate the post-socialist transition itself. The debate over shock therapy versus gradualism, the assessments of EU accession, and the claims of governments about economic performance have all been conducted in GDP terms. Our findings suggest that this framing missed the most consequential dimensions of the transition experience: the mortality crises, the rise in inequality, and the erosion of health systems that accompanied marketisation. The second implication is forward-looking: the welfare dimensions most responsible for the gap—health and distribution—represent potential gains that are large, quantifiable, and invisible in GDP statistics. For Russia, three decades of net GDP gains since the fall of communism have translated into far less welfare improvement than commonly assumed. For Hungary, the life expectancy shortfall relative to Western Europe reduces welfare by roughly a quarter in consumption-equivalent terms—a penalty far exceeding what any plausible GDP acceleration could offset.

The analysis has limitations. The welfare index is a deterministic function of data and calibrated parameters; we do not report confidence intervals or standard errors around the point estimates. The robustness section varies key parameters and data sources one at a time, showing that the qualitative findings are stable, but a formal sensitivity analysis—for example, joint variation across the parameter space or bootstrap resampling of the underlying inequality data—would provide a more systematic characterisation of uncertainty. The consumption inequality series—our weakest data input—relies on imputed Gini coefficients for years and countries where direct consumption data are unavailable. Although our robustness checks show that the main findings survive alternative inequality sources and treatments, better consumption distribution data for the socialist and early transition periods would strengthen the analysis. More broadly, the comparability of PWT expenditure data across the socialist/market divide remains an open question; our pre-1990 welfare levels should be treated as indicative rather than precise. The Jones–Klenow framework itself abstracts from several dimensions of well-being that may be important in the post-socialist context, including economic security, environmental quality, institutional trust, and political freedom. These omissions are common to all applications of the framework, but they may be particularly consequential in societies undergoing fundamental institutional change.

Future research could extend the analysis in several directions. Applying the framework

to the Baltic states, Southeast Europe, and Ukraine—particularly in light of the post-2014 and post-2022 shocks—is a natural next step, contingent on data availability. A micro-level implementation using household survey data would allow the welfare measure to capture within-country heterogeneity in the transition experience, including differences by age, education, and region. Finally, incorporating the welfare framework into formal convergence regressions—testing whether welfare β-convergence differs from income convergence—would provide a more rigorous assessment of whether post-socialist living standards are on a path toward Western European levels or whether the welfare gaps documented here are structural and persistent.

References

Åslund, A. (2007). *How Capitalism Was Built: The Transformation of Central and Eastern Europe, Russia, and Central Asia*. Cambridge: Cambridge University Press.

Åslund, A. (2018). "What Happened to the Economic Convergence of Central and Eastern Europe After the Global Financial Crisis?" *Comparative Economic Studies*, *60*(2), 254–270.

Bergson, A. (1997). "How big was the Soviet GDP?" *Comparative Economic Studies*, *39*(1), 1–14.

Blundell, R., Pistaferri, L., and Preston, I. (2008). "Consumption inequality and partial insurance." *American Economic Review*, *98*(5), 1887–1921.

Boeri, T., and Terrell, K. (2002). "Institutional determinants of labor reallocation in transition." *Journal of Economic Perspectives*, *16*(1), 51–76.

Brainerd, E., and Cutler, D. M. (2005). "Autopsy on an Empire: Understanding Mortality in Russia and the Former Soviet Union." *Journal of Economic Perspectives*, *19*(1), 107–130.

Cieślik, A., and Wciślik, D. R. (2020). "Convergence among the CEE-8 economies and their catch-up towards the EU-15." *Structural Change and Economic Dynamics*, *55*, 39–48.

Dąbrowski, M. (2019). "Russia's Growth Slowdown." *Russian Journal of Economics*, *5*(4), 287–314.

Deininger, K., and Squire, L. (1996). "A new data set measuring income inequality." *World Bank Economic Review*, *10*(3), 565–591.

Easterlin, R. A. (2009). "Lost in transition: Life satisfaction on the road to capitalism." *Journal of Economic Behavior & Organization*, *71*(2), 130–145.

Eftimoski, D. (2020). "Some new insights on economic convergence and growth in Central, Eastern, and Southeastern Europe." *Empirica*, *47*(4), 863–884.

Estrin, S., Urga, G., and Lazarova, S. (2001). "Testing for ongoing convergence in transition economies, 1970 to 1998." *Journal of Comparative Economics*, *29*(4), 677–691.

Feenstra, R. C., Inklaar, R., and Timmer, M. P. (2015). "The next generation of the penn world table." *American Economic Review*, *105*(10), 3150–3182.

Gimpelson, V. (2018). "Labor market institutions and policies." *IZA World of Labor*, 466.

Gimpelson, V., and Kapeliushnikov, R. (2011). "Labor market adjustment: Is Russia different?" Discussion Paper 5588, IZA.

Grün, C., and Klasen, S. (2001). "Growth, income distribution and well-being in transition countries." *Economics of Transition*, *9*(2), 359–394.

Grün, C., and Klasen, S. (2012). "Has transition improved well-being?" *Economic Systems*, *36*(1), 11–30.

Guriev, S., and Melnikov, N. (2018). "Happiness convergence in transition countries." *Journal of Comparative Economics*, *46*(3), 683–707.

Guriev, S., and Zhuravskaya, E. (2009). "(un)happiness in transition." *Journal of Economic Perspectives*, *23*(2), 143–168.

Hamm, P., King, L. P., and Stuckler, D. (2012). "Mass privatization, state capacity, and economic growth in post-communist countries." *American Sociological Review*, *77*(2), 295–324.

Heinrichs, K. (2016). "German consumption inequality: An evaluation with a focus on the financial crisis.", beiträge zur Jahrestagung des Vereins für Socialpolitik 2016: Demographischer Wandel, No. A06-V2.

Heston, A. (1994). "A brief review of some problems in using national accounts data in level of output comparisons and growth studies." *Journal of Development Economics*, *44*(1), 29–52.

Jones, C. I., and Klenow, P. J. (2016). "Beyond GDP? Welfare across Countries and Time." *American Economic Review*, *106*(9), 2426–2457.

Kornai, J. (1992). *The Socialist System: The Political Economy of Communism*. Princeton: Princeton University Press.

Kukić, L. (2021). "The nature of technological failure: Patterns of biased technical change in socialist europe." *Journal of Economic Surveys*, *35*(3), 895–925.

Leeson, P. T., and Trumbull, W. N. (2006). "Comparing apples: Normalcy, Russia, and the remaining post-socialist world." *Post-Soviet Affairs*, *22*(3), 225–248.

Lehmann, H., and Muravyev, A. (2012). "Labor market institutions and labor market performance: What can we learn from transition countries?" *Economics of Transition*, *20*(2), 235–269.

Leon, D. A., Chenet, L., Shkolnikov, V. M., Zakharov, S., Shapiro, J., Rakhmanova, G., Vassin, S., and McKee, M. (1997). "Huge Variation in Russian Mortality Rates 1984–94: Artefact, Alcohol, or What?" *The Lancet*, *350*(9075), 383–388.

Maddison, A. (1998). "Measuring the performance of a communist command economy: An assessment of the CIA estimates for the U.S.S.R." *Review of Income and Wealth*, *44*(3), 307–323.

Marer, P. (1985). *Dollar GNPs of the USSR and Eastern Europe*. Baltimore: Johns Hopkins University Press, published for the World Bank.

Milanovic, B. (1998). *Income, Inequality, and Poverty During the Transition from Planned to Market Economy*. Washington, DC: The World Bank.

Murrell, P. (1993). "What is shock therapy? What did it do in Poland and Russia?" *Post-Soviet Affairs*, *9*(2), 111–140.

Novokmet, F. (2021). "Long-run inequality in communist countries: Before, during and after." In *The Palgrave Handbook of Comparative Economics*, Palgrave Macmillan, chapter in edited volume.

Novokmet, F., Piketty, T., and Zucman, G. (2018). "From soviets to oligarchs: inequality and property in russia 1905-2016." *The Journal of Economic Inequality*, *16*(2), 189–223.

Piątkowski, M. (2018). *Europe's Growth Champion: Insights from the Economic Rise of Poland*. Oxford: Oxford University Press.

Pop-Eleches, G., and Tucker, J. A. (2017). *Communism's Shadow: Historical Legacies and Contemporary Political Attitudes*. Princeton: Princeton University Press.

Rapacki, R., and Próchniak, M. (2009). "Real beta and sigma convergence in 27 transition countries, 1990–2005." *Post-Communist Economies*, *21*(3), 307–326.

Shkolnikov, V. M., Cornia, G. A., Leon, D. A., and Meslé, F. (1998). "Causes of the Russian Mortality Crisis: Evidence and Interpretations." *World Development*, *26*(11), 1995–2011.

Shleifer, A., and Treisman, D. (2005). "A normal country: Russia after communism." *Journal of Economic Perspectives*, *19*(1), 151–174.

Solt, F. (2020). "Measuring income inequality across countries and over time: The standardized world income inequality database." *Social Science Quarterly*, *101*(3), 1183–1199.

Stuckler, D., King, L., and McKee, M. (2009). "Mass privatization and the post-communist mortality crisis: A cross-national analysis." *The Lancet*, *373*(9661), 399–407.

Svejnar, J. (2002). "Transition economies: Performance and challenges." *Journal of Economic Perspectives*, *16*(1), 3–28.

UNU-WIDER (2024). "World Income Inequality Database (WIID)." Version 29 April 2025, helsinki: UNU-WIDER.

Voskoboynikov, I. B. (2017). "Sources of Long-Run Growth in Russia before and after the Global Financial Crisis." *Russian Journal of Economics*, *3*(4), 348–365.

World Bank (2024). "World Development Indicators." Washington, DC: The World Bank.

Appendix A. Data sources and variable construction

Countries, period and overview

We analyse Poland, Hungary, Czechia, Slovakia and Russia, and we use Germany as the main reference country. The data are annual and cover the late socialist and post–socialist transformation period, starting in 1980 whenever this is permitted by data availability. For each country and year we assemble four building blocks of the index: (i) real consumption per person; (ii) life expectancy; (iii) hours worked and leisure; and (iv) the dispersion of consumption across households.

All macroeconomic quantities are expressed in international dollars at constant purchasing power parities, and the welfare index is computed using the preference parameters and functional forms described in the main text, following Jones and Klenow (2016).

National accounts and demographics

Real consumption and GDP per person, population, employment and hours worked per employee come from version 11.0 of the Penn World Table (PWT; Feenstra et al., 2015). We use the expenditure–side measure of real GDP, the aggregate of private and public consumption, total population, total employment and the series on average annual hours per worker.

Real consumption and real GDP per person are obtained by dividing the corresponding PWT aggregates by total population. These series provide the level of material living standards and the income comparator used in the welfare decomposition.

Life expectancy at birth and the age structure of the population come from the World Bank's World Development Indicators (WDI; World Bank, 2024). We merge WDI to PWT by country and year. To reduce the influence of short–run noise and measurement error, life expectancy is smoothed using a three–year centred moving average at the country level: interior years are replaced by the average of the previous, current and next observation, while the first and last available year in each country are averaged with their single neighbour. If only one observation is available for a country, it is used without smoothing. We also construct the size and share of the adult (15+) population from WDI age shares and PWT total population, which is used in descriptive statistics and robustness checks.

Consumption inequality

The inequality component of the index requires a measure of the dispersion of individual consumption. For the five CEE economies we rely on the World Income Inequality Database (WIID; UNU-WIDER, 2024). We start from the full WIID download and retain only observations for the relevant countries and for three welfare concepts: consumption, net income and gross income.

To increase comparability across observations, we classify each WIID estimate into four equivalence–scale groups (OECD–modified equivalence scale, other equivalence scales, per–capita measures, and a residual "other" group) and use WIID's quality flag to rank estimates from highest to lowest quality. Within each country, year, welfare concept and equivalence group we keep only estimates with the best available quality and average them if several remain.

We then align consumption and income concepts. For each equivalence–scale group we construct a corresponding income Gini, preferring net income to gross income if both are available. For country–year cells where both consumption and income Ginis are observed, we compute their difference and take the mean difference within each equivalence–scale group.

These group–specific mean gaps are used to impute missing consumption Ginis in cells where only income Ginis are available: the income Gini is shifted by the appropriate average gap. This Deininger and Squire (1996) style "constant gap" procedure preserves cross–country and time variation in income inequality while reflecting the typical difference between income and consumption inequality within each group.

In a final step we collapse the possibly multiple consumption Ginis within each country–year to a single preferred value using the priority ordering OECD–modified equivalence scale, other equivalence scales, per–capita measures and the residual group. The resulting series is then converted to an annual panel starting in 1980 by linearly interpolating between survey years.

For Germany we follow the same WIID–based procedure, but we also append an external dataset of consumption Gini coefficients derived from household budget survey data as reported in Heinrichs (2016). These additional observations are treated on a par with WIID consumption Ginis, subject to the same equivalence–scale and quality filters. We again impute missing consumption Ginis from income Ginis using the equivalence–group–specific gaps and interpolate to obtain an annual series.

Assuming that the distribution of (equivalised) consumption is lognormal, we convert the annual Gini coefficients into the variance of log consumption using the standard relationship between the two. This variance provides the inequality term entering the welfare index.

Hours worked and leisure

The leisure component uses data on hours worked. We first construct annual hours worked per person by combining PWT information on average hours per worker, employment and population. This measure captures the average number of market hours supplied per person in the population.

The PWT series on hours per worker has some gaps at the beginning of the sample. For Czechia, hours per worker are missing in 1990–1992; we replace these values with the corresponding Slovak estimates, exploiting the fact that the two countries shared a common labour market at the end of the socialist period. For Russia, hours per worker are missing in 1990–1991; here we set both years equal to the first available observation in 1992. For Poland, the PWT series is missing for most of the 1980s and early 1990s. We fill these gaps using information on hours worked from the OECD Employment Outlook and from Kukić (2021), and we interpolate linearly between survey years for 1990–1992. After these adjustments we recompute annual hours per person.

To measure leisure we follow Jones and Klenow in assuming a fixed yearly time endowment corresponding to sixteen waking hours per day. Leisure is then defined as the complement of hours worked in this time endowment. This leisure share is mapped into a utility term using the parametric function and preference parameters described in Appendix Appendix B.

Appendix B. Welfare measure: formal derivation

This appendix presents the formal derivation of the consumption-equivalent welfare index used in the main text, following Jones and Klenow (2016).

Preferences

We assume preferences of the form

$$u(c, \ell) = \log c + v(\ell), \tag{1}$$

with utility additively separable in consumption c and leisure ℓ. Defining the work share as $n \equiv 1-\ell$, where $\ell = 1-H/L_0$ and $L_0 = 5{,}840$ is the annual waking-hours endowment, the leisure utility function takes the form

$$v(\ell) = -\theta \, \frac{n^{1+1/\varepsilon}}{1+1/\varepsilon}, \tag{2}$$

with labour disutility parameter $\theta = 14.2$ and Frisch elasticity $\varepsilon = 1$. We also assume that consumption within each country is lognormally distributed across individuals, with arithmetic mean c_i and variance of log consumption σ_i^2. Under these assumptions, $E[\log c] = \log c_i - \sigma_i^2/2$. Throughout the paper, σ_i^2 denotes the variance of log consumption; the tables report the standard deviation σ_i in raw-data rows.

The per-period utility function $u(c,\ell)$ defined above captures the flow payoff from consumption and leisure. To value *longevity*, the Jones–Klenow framework requires the overall level of lifetime utility, not just its consumption and leisure components. This is captured by the intercept $\bar{u}$, calibrated from the value of a statistical life (VSL), which enters the expected flow utility as $\phi_j \equiv \bar{u} + E[\log c_j] + v(\ell_j) = \bar{u} + \log c_j + v(\ell_j) - \frac{1}{2}\sigma_j^2$. A higher $\bar{u}$ means life is more valuable, amplifying the welfare weight of life expectancy differences. The baseline value $u^- = 5.2325$ is taken from Jones and Klenow (2016).

Level decomposition

Following Jones and Klenow (2016), the consumption-equivalent welfare index for country i relative to the United States is given by:

$$\log \lambda_i = \underbrace{\frac{e_i - e_{US}}{e_{US}} \left(\bar{u} + \log c_i + v(\ell_i) - \frac{1}{2}\sigma_i^2 \right)}_{\text{life expectancy}} + \underbrace{(\log c_i - \log c_{US})}_{\text{consumption}} + \underbrace{(v(\ell_i) - v(\ell_{US}))}_{\text{leisure}} - \underbrace{\frac{1}{2}(\sigma_i^2 - \sigma_{US}^2)}_{\text{inequality}}, \tag{3}$$

where e_i is life expectancy at birth, c_i is average consumption per capita, ℓ_i is leisure, $v(\ell_i)$ is the utility from leisure, and σ_i^2 is the variance of log consumption. The parameter $\bar{u}$ is an intercept calibrated from the value of a statistical life. Aggregate consumption per capita is normalised so that $c_{US,0} = 1$ in the base year (2007); the calibration of $\bar{u}$ is performed under this normalisation.

Welfare relative to income, rebased to Germany

In the empirical analysis we focus on welfare relative to per-capita income, $\lambda_i/\tilde{y}_i$, where $\tilde{y}_i \equiv y_i/y_{DE}$ is GDP per capita relative to Germany. While Jones and Klenow (2016) take the United States as the benchmark country, our results use Germany as the reference. We rebase by subtracting Germany's $\log(\lambda_{DE}/\tilde{y}_{DE})$ from each country's value, so that all four components equal zero for Germany. Applying equation (3) and subtracting the corresponding German terms, the rebased decomposition is:

$$\begin{aligned} \log \frac{\lambda_i}{\tilde{y}_i} - \log \frac{\lambda_{DE}}{\tilde{y}_{DE}} = {} & \underbrace{\frac{e_i - e_{US}}{e_{US}} \phi_i - \frac{e_{DE} - e_{US}}{e_{US}} \phi_{DE}}_{\text{life expectancy}} \\ & + \underbrace{\left[\log \frac{c_i}{y_i} - \log \frac{c_{DE}}{y_{DE}}\right]}_{\text{consumption share } C/Y} + \underbrace{(v(\ell_i) - v(\ell_{DE}))}_{\text{leisure}} - \underbrace{\frac{1}{2}(\sigma_i^2 - \sigma_{DE}^2)}_{\text{inequality}}, \end{aligned} \tag{4}$$

where $\phi_j \equiv \bar{u} + \log c_j + v(\ell_j) - \frac{1}{2}\sigma_j^2$ denotes per-period expected utility in country j. The life-expectancy component is the difference of two US-referenced terms—one evaluated at country i's data, the other at Germany's—because the calibration of $\bar{u}$ requires the US normalisation. The consumption share, leisure, and inequality components are Germany-relative. Setting $i = DE$ yields zero for every component, confirming internal consistency. In the tables we report the contributions of each term in (4), in a format comparable to Table 7 in Jones and Klenow (2016).

Growth decomposition

To compare welfare growth with GDP per capita growth, define average annual growth rates over a period $[t_0, t_1]$ with $T = t_1 - t_0$:

$$g_{\lambda,i} \equiv \frac{\log \lambda_{i,t_1} - \log \lambda_{i,t_0}}{T}, \qquad g_{y,i} \equiv \frac{\log y_{i,t_1} - \log y_{i,t_0}}{T}. \tag{5}$$

The welfare–income growth gap is

$$g_{\lambda,i} - g_{y,i} = \frac{1}{T}\left[\log\left(\frac{\lambda_{i,t_1}}{y_{i,t_1}}\right) - \log\left(\frac{\lambda_{i,t_0}}{y_{i,t_0}}\right)\right]. \tag{6}$$

Denoting the four components of $\log(\lambda_{i,t}/y_{i,t})$ by $L_{i,t}$ (life expectancy), $C_{i,t}$ (consumption share), $R_{i,t}$ (leisure), and $I_{i,t}$ (inequality), we obtain:

$$g_{\lambda,i} - g_{y,i} = \underbrace{\frac{L_{i,t_1} - L_{i,t_0}}{T}}_{\Delta L_i/T} + \underbrace{\frac{C_{i,t_1} - C_{i,t_0}}{T}}_{\Delta C_i/T} + \underbrace{\frac{R_{i,t_1} - R_{i,t_0}}{T}}_{\Delta R_i/T} - \underbrace{\frac{I_{i,t_1} - I_{i,t_0}}{T}}_{\Delta I_i/T}, \tag{7}$$

so that each component's contribution is simply its change over the period divided by the number of years. Each term is expressed in percentage points per year.

Growth decomposition rebased to Germany

In Table 2 we report the growth decomposition rebased to Germany by subtracting Germany's values:

$$\Delta(g_\lambda - g_y)_i \equiv (g_{\lambda,i} - g_{y,i}) - (g_{\lambda,DE} - g_{y,DE}). \tag{8}$$

The same subtraction applies to each decomposition component. For the consumption share, leisure, and inequality components, this rebasing ensures that the US normalisation cancels: these terms in equation (7) are common to country i and Germany, so taking the difference eliminates them. The consumption share column, for example, becomes $\Delta C_i/T - \Delta C_{DE}/T$, which equals the change in $\log(C/Y)$ for country i minus the corresponding change for Germany—a quantity that depends only on each country's own consumption share dynamics, not on US trends. The life-expectancy term retains a dependence on e_{US} because longevity is valued relative to US life expectancy in the underlying formula; however, the robustness checks using alternative benchmarks confirm that this dependence does not affect the qualitative results (see the main text). A positive convergence gap indicates that the country's welfare converged faster than GDP toward Germany; negative indicates slower convergence.

Parameter values

The baseline calibration uses the following parameter values from Jones and Klenow (2016): utility intercept $\bar{u} = 5.2325$ (calibrated from the value of a statistical life); Frisch elasticity of labour supply $\varepsilon = 1$; labour disutility parameter $\theta = 14.2$; and annual waking time endowment $L_0 = 5{,}840$ hours (sixteen hours per day, 365 days). Sensitivity to alternative parameter values is examined in Section 7 of the main text.

University of Warsaw
Faculty of Economic Sciences
44/50 Długa St.
00-241 Warsaw
www.wne.uw.edu.pl
ISSN 2957-0506