

Where will growth come from?

Reallocation, the missing factor in Hungary

Abstract

Hungary needs growth that does not burden the budget. We ask whether part of it can come from workers and capital moving from less to more productive firms. Using balance sheets of all Hungarian firms for 2004–2023 and CompNet data for Poland and Central and Eastern Europe, we run three exercises. By the late 2010s productivity gaps between firms in the same industry were wider in Hungary than in Poland and the region on every measure we have, and in Hungary they did not narrow after 2019. The contribution of resources moving between firms to productivity growth fell by almost half after 2013, from 1.6 to 0.8 percentage points a year. About 60% of this fall comes from foreign-owned firms; among domestic firms reallocation slowed by about a quarter. At the same time, the model's efficiency gap, the output lost to misallocation, widened among domestic firms at least as much as overall, most in construction and utilities. A standard model suggests that returning to the allocation of 2004–2010 would lift the level of output by 1–2% of GDP, a one-off but lasting gain; over five years, 0.2–0.4 percentage points of extra growth a year. Policy that gives firms more freedom could mobilise this reserve.

Keywords: productivity, reallocation, misallocation, firm dynamics, Hungary.

JEL: D24, L25, O47, O52.

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2026/01

16 October 2026

Executive summary

The message. Hungary needs to reduce a large budget deficit, expected at 7.5% of GDP in 2026, and is looking for growth that does not cost the budget. One such source is already in the economy. Aggregate productivity grows when firms improve, and also when workers and capital move from less productive to more productive firms. In Hungary this second channel has weakened, and productivity gaps between firms did not narrow as they did in Poland and the region. Economic policy that gives firms more room to grow, shrink, enter and exit could mobilise this reserve.

What we found (balance sheets of all Hungarian double-entry firms, 2004–2023; CompNet data for Poland and the CEE region):

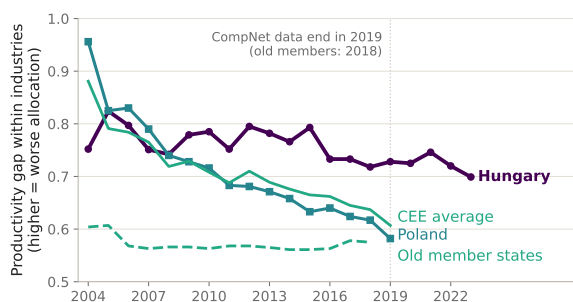
- **Gaps between firms stayed wide.** By the late 2010s productivity gaps between firms in the same industry were wider in Hungary than in Poland and the CEE region on every measure we have, while Poland's were close to those of the old EU member states. In Hungary the gaps did not narrow after 2019.
- **Resources moved less.** Workers moving to better firms, and weak firms leaving, added 1.6 percentage points a year to productivity growth in 2004–2013 and 0.8 in 2013–2022, a fall of almost half. The weakest years were 2013–2016 and 2019–2022. About 60% of the fall comes from foreign-owned firms. Growth since 2016 came mostly from firms improving themselves.
- **The reserve is sizeable.** If allocation only returned to its 2004–2010 state, a standard model suggests that the same workers and capital would produce 1–2% of GDP more: a one-off rise in the level of output that then persists. Reached over five years, this is 0.2–0.4 percentage points of extra growth a year.

Growth that does not cost the budget: a reserve in how resources are allocated

Exercise 1: Hungary's gaps about 0.1 wider than Poland's, on every measure

Exercise 2: from 1.6 to 0.8 points of growth a year

Exercise 3: 1–2% of GDP, a one-off rise in output



Productivity gaps between firms in the same industry (higher = wider gaps), firms with 20+ employees. Hungary: own data; Poland, CEE average and old member states: CompNet, to 2019.

What this suggests. Reallocation works when markets let productive firms grow and weak ones shrink or exit. The research on misallocation points to rules that apply equally to all firms, open entry and competition, measures that change margins in particular industries only temporarily, and no obstruction of exit. None of these requires public money. Because reallocation raises total factor productivity, the growth it brings comes on top of what new investment brings. The evidence is descriptive: it shows that allocation did not improve, not which policy is responsible.

Equal rules, open entry and exit: no public money needed

1 Introduction

Hungary runs a large budget deficit. For 2026 the Ministry of Finance expects 7.5% of GDP (Pénzügyminisztérium, 2026) and the central bank 6.9% (Magyar Nemzeti Bank, 2026), against the 3% limit of the Maastricht criteria. Bringing it down limits what the state can spend to support growth. This raises a practical question: are there resources already in the economy that could be mobilised by better economic policy, without new spending?

This note looks for one such resource. It asks how well the Hungarian economy allocates the workers and capital it already has, whether this has changed, and how much output a better allocation could add.

Growth comes from more workers, more capital and higher productivity. The first source is running out: employment grew by almost a fifth between 2010 and 2023, while the working-age population is shrinking.¹ The second needs investment that has to be financed, and Hungary already invests a lot: in 2018–2022 gross fixed capital formation was 25–28% of GDP a year, the third-highest rate in the EU after Ireland and Estonia, against 16–19% in Poland.² Hence growth has to come mostly from productivity, and a country that invests this much has reason to ask how well its capital is allocated.

Aggregate productivity rises in two ways. Firms can get better: they adopt new technology, improve management or find new markets. Or labour and capital can move from less productive to more productive firms in the same industry. This second channel, *reallocation*, requires markets in which good firms can grow and weak firms can shrink or close.

The two channels are not separate from investment. New investment is itself a choice of which firms grow: capital that goes to productive firms raises aggregate productivity, capital that goes to weak or favoured ones does not. So the question is not only how much Hungary invests, but who invests, and where.

Reallocation can also happen between industries, as workers move from manufacturing to services or from traditional to knowledge-intensive industries. This note leaves that channel aside and compares firms within the same industry. For Hungary, Muraközy et al. (2018) found a clear shift of employment from manufacturing to services until 2010 and nearly constant sector shares after, with the overwhelming majority of productivity growth taking place within industries.

When rules, regulations or interventions make it harder for productive firms to expand or for weak firms to shrink, inputs stay where they produce less than they could. Economists call this *misallocation*. In the last decade Hungarian firms faced frequent changes in regulation, sector-specific taxes and, in 2021–2023, price caps on fuel, basic foods and mortgage rates. Each measure had its own goal. Taken together, they may also have changed which firms grow.

A deficit near 7% of GDP: can growth come without new spending?

Labour is running out and investment is already high: growth has to come from productivity

Productivity grows when firms improve, or when resources move to better firms

Misallocation: rules that keep inputs in weaker firms

¹ Employed persons aged 20–64: 3.83 million in 2010, 4.55 million in 2023 (Eurostat lfsi_emp_a). Population aged 15–64: 6.87 million in 2010, 6.18 million in 2025 (Eurostat demo_pjanbroad).

² Eurostat nama_10_gdp, P51G as a share of GDP; average 2017–2022: Hungary 25.9%, EU 21.5%.

Hsieh and Klenow (2009) showed with firm data that misallocation can lower aggregate productivity by a large amount. Restuccia and Rogerson (2017) list the causes: taxes and regulations that depend on firm size or identity, financial frictions and weak property rights.

For Hungary, Muraközy et al. (2018) found strong reallocation before 2008 and much weaker reallocation after 2013, and Koren and Rátfai (2026) find that the employment growth advantage of the most productive Hungarian firms has shrunk steadily since the 1990s. In the region, CompNet data show that the countries that joined the EU in 2004 narrowed the productivity gaps between their firms towards the level of the old member states (Grassi, 2026). We extend these lines to 2023 and put Hungary next to Poland and the region. Appendix A reviews the related literature in more detail.

We use the balance sheets of every Hungarian double-entry firm from 2004 to 2023 and run three exercises, each answering one question. Exercise 1 asks whether resources are where they earn most, by comparing productivity gaps between firms with Poland and the region. Exercise 2 asks how much growth still comes from resources moving to better firms, by splitting productivity growth into firms improving and resources moving. Exercise 3 asks how much is at stake, using a standard model.

The note proceeds as follows. Section 2 describes the data. Section 3 defines four terms, presents the three exercises, compares foreign-owned and domestic firms and applies two of the exercises to four industries. Section 4 puts the results together, Section 5 discusses policy and Section 6 sets out the caveats. The appendix reviews the related literature (Appendix A), describes the data sources, variable definitions and sample rules (Appendix B), gives the method, validation and robustness checks of each exercise (Appendices C–G) and explains how the results can be reproduced (Appendix H). The main-text figures also appear in the slide deck that accompanies the note.

2 Data

Our main source is the Hungarian balance-sheet panel (Mérleg LTS, version 5.9.0) for 2004–2023. It covers every firm that keeps double-entry books. KRTK compiled it from corporate tax returns until 2014 and from Opten company records from 2015, with contributions by CEU MicroData. For each firm and year we observe sales, material costs, value added, employment, labour cost, depreciation, tangible and intangible assets, equity, liabilities and the industry code.

Each exercise uses the sample its method and comparison call for. Exercise 1 follows CompNet: firms with at least 20 employees in CompNet’s industries, about 9,500–13,500 firms a year. Exercises 2 and 3 use the market economy, firms with at least five employees, as in Muraközy et al. (2018): 46,000–62,000 firms a year. All three exercises compare firms within the same two-digit industry; shifts of workers and capital between industries are not counted. Appendix B gives the data sources, variable definitions and sample rules in detail.

Earlier work: reallocation weakened in Hungary after 2013, while gaps narrowed in the region

Three exercises on all Hungarian firms, 2004–2023

Data, three exercises, synthesis, policy and caveats; details in the appendix

Balance sheets of all Hungarian double-entry firms, 2004–2023

Firms with 20+ employees for the comparison with CompNet, 5+ for the market economy

For the comparison we use CompNet, which computes the same firm-level indicators with the same code in each member country (CompNet, 2021). We use its 8th vintage, firms with 20 or more employees, as aggregated by Basile Grassi for Grassi (2026). It covers Hungary from 2004 and ends in 2019.

We compare Hungary with Poland and with the average of the Central and Eastern European countries that joined the EU in 2004 and report to CompNet (the CEE average); the average of the old member states serves as a reference level. CompNet's Hungarian data come from the same tax returns as ours, so for 2004–2019 we check our Hungarian series against CompNet's own (Appendix C).

A price index common to all firms in an industry and year does not change Exercises 1 and 3, which compare firms within an industry and year. Differences in firms' own prices and markups do remain, because we observe revenue, not physical output. Exercise 2 measures growth over time and needs value added at constant prices. We use two price indices and show both, because they disagree in the inflation years 2021–2023. Our sample's value added grew at the same rate as the national accounts until 2022, but more slowly in 2023, so we treat 2023 as provisional.

CompNet: the same measures for Poland and the region, to 2019

Prices matter only for growth over time; 2023 data are provisional

3 Three exercises

This section presents the evidence. We first define four terms that recur throughout the note. We then take the three exercises in turn. For each we say what we compute and why it tells us something about allocation, describe the data, show the result and discuss what it means. All three ask whether workers and capital are used where they produce most. Wider productivity gaps between firms in the same industry, a smaller contribution of resources moving to growth and a larger efficiency gap would each point to less efficient allocation. Section 3.5 compares foreign-owned and domestic firms, and Section 3.6 applies Exercises 2 and 3 to four industries. Methods, validation and robustness checks are in Appendices C–G.

3.1 Four terms

The four terms below recur throughout the note.

Productivity of a firm. How much value added a firm produces from its inputs. *Labour productivity* is value added per employee. *Total factor productivity* (TFP) also accounts for capital: value added relative to a combination of labour and capital, each weighted by its share in costs. We measure TFP as a *Solow residual*, what is left of value added after labour and capital are accounted for. Because we observe sales and not physical output, it is *revenue productivity*: a firm that charges higher prices looks more productive.

Productivity gaps within an industry. In a market that works, productive firms expand and bid up the price of labour and capital, weak firms shrink, and the gap between them narrows. Because we measure revenue productivity, in a market without

frictions it would be nearly equal across firms in an industry: a more productive firm sells more at a lower price until its revenue per unit of input matches its competitors'. A wide, persistent gap suggests that something keeps resources from flowing to where they earn most, though measurement and market power also widen it. We measure the gap as the spread of TFP across firms in the same industry and year, relative to its average.

Reallocation. Aggregate productivity in an industry is the employment-weighted average of its firms' productivity. It rises when firms get better, when employment shifts towards more productive firms (reallocation), or when weak firms leave the sample and new ones enter (entry and exit). The last two together are the part of growth that comes from resources moving.

Misallocation and the efficiency gap. If every firm in an industry earned the same return on its last worker and its last forint of capital, no reshuffling of inputs could raise output. The *efficiency gap* is how much more an industry would produce at that point with the same inputs, as a share of its value added; Hsieh and Klenow (2009) call it the potential gain. It is a model benchmark: adjustment costs, risk and measurement error also create differences in returns. Its change over time is more informative than its level.

3.2 Exercise 1: how far apart are firms in the same industry?

The first exercise asks whether resources are where they earn most. If workers and capital move freely, productive firms expand until the extra return on their inputs falls to the level of their competitors, and the gaps between firms in an industry narrow over time. A spread that stays wide suggests that resources are not moving to where they earn most (Hsieh and Klenow, 2009). For every firm we compute total factor productivity as a Solow residual, weighting labour and capital by their shares in costs. Within each two-digit industry and year we take the standard deviation divided by the mean, and combine industries into one number, giving more weight to industries with more firms. This is CompNet's measure, so Hungary can be put next to Poland and the region. For Hungary we use all firms with 20 or more employees in CompNet's industries, 2004–2023; for Poland, the CEE average and the old member states, CompNet's series computed the same way, to 2019 (CompNet, 2021; Grassi, 2026). Appendix C gives the method and checks our Hungarian series against CompNet's own.

Figure 1 shows the spread of TFP between firms in the same industry, combined over industries; higher values mean wider gaps. In the mid-2000s Hungary, Poland and the region were at about the same level, 0.76–0.80, well above the old member states at 0.58. Poland's line then fell almost every year and by 2019 reached the level of the old member states. Hungary's rose during the crisis, fell back in 2016, the year after the data source changed (CompNet's own Hungarian series falls at the same time), and stayed around 0.72–0.75.

By 2019 the Hungarian gap was clearly larger than the Polish one, and CompNet's own Hungarian series gives the same picture.³ Adding an imputed financing cost

Wider productivity gaps within an industry signal worse allocation

Hungary's gaps stayed wide (0.72–0.75) and by 2019 were clearly wider than Poland's

³ The level difference holds on all three productivity measures that CompNet publishes: labour productivity, TFP with fixed weights and TFP with cost-share weights. The contrast in trends, with

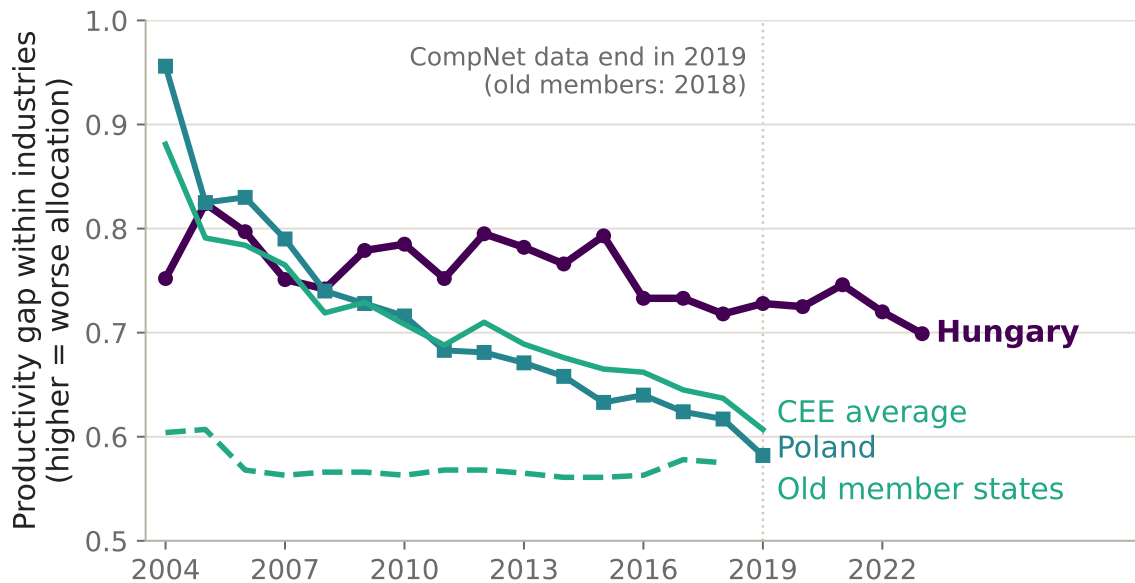


Figure 1: Exercise 1: productivity gaps between firms in the same industry, 2004–2023

Notes: Standard deviation divided by the mean of firm-level TFP (Solow residual with time-varying cost-share weights, cost of capital equal to depreciation) within two-digit industries, combined across industries as a root mean square weighted by the number of firms; firms with 20 or more employees, CompNet industries. Hungary: own calculation from the Mérleg LTS panel. Poland, CEE average (2004 EU joiners reporting to CompNet; Hungary is part of this average) and old member states (9 EU-15 countries with data, shown while at least 5 report): CompNet 8th vintage, aggregated by B. Grassi. A version with an imputed financing cost in the cost of capital is in Figure 5.

to the cost of capital raises the Hungarian line somewhat when interest rates were high, in 2009–2013 and 2022–2023, and changes nothing else (Appendix C).

Persistent gaps mean that more productive Hungarian firms did not grow enough to close them, or less productive ones did not shrink. This is consistent with an economic environment that held resources in less productive firms. It is also consistent with other explanations, such as a different industry mix, differences in prices and markups, or measurement. Exercise 1 cannot tell these apart.

Consistent with resources held in weaker firms; other explanations remain open

3.3 Exercise 2: how much growth comes from resources moving?

Exercise 1 describes the state of allocation in a given year. Exercise 2 looks at the flow: how much productivity growth comes from workers moving between firms and from firms entering and leaving. An industry's productivity can grow even if no firm gets better: when employment shifts from weaker to stronger firms, when weak firms leave and when strong ones enter. If this part shrinks, one of the two channels of productivity growth weakens. We first split growth into its parts, then follow the part that comes from resources moving over two decades, and finally ask how much of its change comes from foreign-owned firms.

Productivity growth has two sources: firms improving and resources moving

Following Foster et al. (2001), the change in an industry's productivity over three years splits into four parts: (i) *within firms*, as continuing firms improve; (ii) *reallocation*, as employment shifts between continuing firms towards more productive ones; (iii) *entry*; and (iv) *exit*. We decompose within each two-digit

Four parts: firms improving, employment shifting, entry and exit

the three starting level and Poland narrowing much more, appears on the cost-share measure only. In Hungary the gaps did not narrow after 2019 on any of the three (Appendix D).

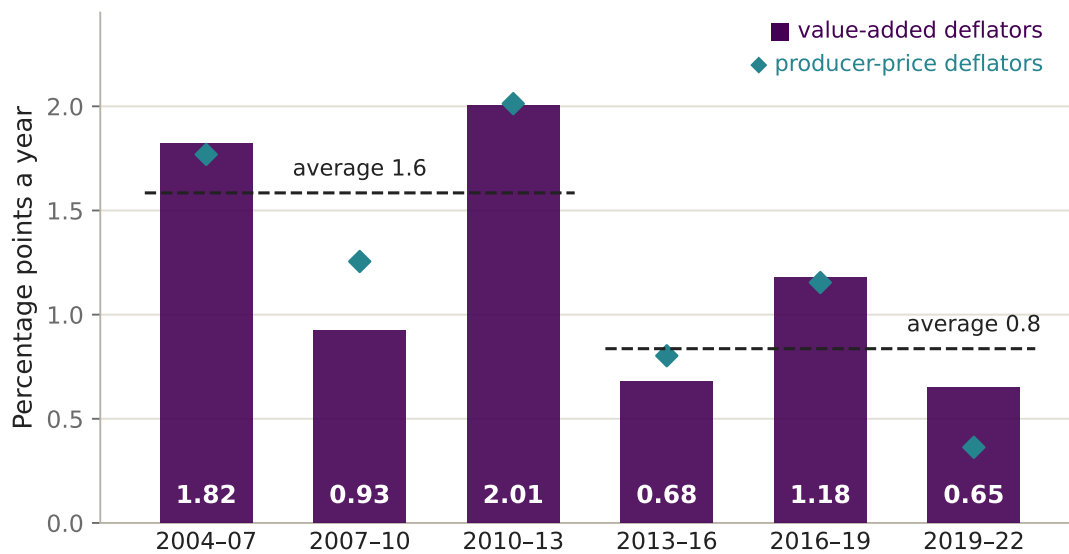


Figure 2: Exercise 2: contribution of resources moving between firms to productivity growth, by three-year window

Notes: Reallocation (between and cross terms) plus net entry and exit, annual percentage points; Foster–Haltiwanger–Krizan decomposition within two-digit industries, employment weights, market economy, firms with 5+ employees. Bars: value-added deflators; diamonds: producer price indices. Dashed lines: averages for 2004–2013 and 2013–2022. The provisional one-year window 2022–2023 is not shown. Period averages of all components are in Table 1.

industry and aggregate with employment weights. The second, third and fourth parts together are the growth that comes from resources moving. The split follows employment, so it shows where workers go; TFP itself includes capital. Appendix E gives the formulas.

We use all market-economy firms with at least five employees, 2004–2022, in three-year windows; 2022–2023 is reported in Table 1 but treated as provisional. Value added is at constant prices, deflated with industry value-added price indices from the national accounts (Eurostat, 2026). The total is the change in the employment-weighted average of firms’ log TFP within industries. It is not aggregate TFP from the national accounts, which weights firms by output and covers the whole economy, and it can grow much faster, as in 2016–2019. We use it only to split growth into its sources. Entry and exit mean entering or leaving the observed sample of an industry. Most are firms appearing in or disappearing from the data; some are continuing firms that changed industry, and some disappearances are firms that stopped reporting or fell below the size rule, not closures.

These choices affect the levels, not the main finding. Appendix F shows what happens when we change them: producer price indices instead of value-added deflators, a labour weight without the financing cost, entry and exit defined by crossing the five-employee line, dropping firms that change industry, splitting the cross term equally between firms improving and reallocation, and the decomposition of Melitz and Polanec (2015). In every case the contribution of resources moving is lower in 2013–2022 than in 2004–2013. Dropping firms that change industry raises the earlier contribution and leaves the later one nearly unchanged; the Melitz–Polanec decomposition makes the decline larger.

All market-economy firms with 5+ employees, 2004–2022, in three-year windows

The fall after 2013 holds in every alternative we tried

Table 1: Exercise 2: sources of productivity growth, annual percentage points

	2004–13	2013–22	2013–16	2016–19	2019–22	2013–23
Firms improving (within)	0.55	2.84	1.85	3.95	2.71	1.76
Between	1.12	0.84	0.65	0.80	1.06	0.85
Cross	–0.53	–0.60	–0.44	–0.41	–0.95	–0.68
Reallocation (between + cross)	0.59	0.23	0.21	0.39	0.10	0.17
Entry	–0.31	0.00	–0.34	0.44	–0.10	–0.10
Exit	1.31	0.60	0.81	0.35	0.65	0.60
Net entry and exit	1.00	0.60	0.47	0.79	0.55	0.50
Resources moving (reallocation + net entry)	1.58	0.84	0.68	1.18	0.65	0.67
Total	2.14	3.67	2.53	5.13	3.36	2.43
<i>Share of total growth from resources moving</i>	74%	23%	27%	23%	19%	28%
<i>Resources moving, producer prices</i>	1.68	0.77	0.80	1.15	0.36	0.66
<i>Share of total growth, producer prices</i>	72%	26%	24%	23%	102%	26%

Notes: Foster–Haltiwanger–Krizan decomposition within two-digit industries, aggregated with industry employment weights; annualised log changes $\times 100$. Three-year windows; 2004–13 and 2013–22 average three windows each; 2013–16, 2016–19 and 2019–22 are single windows; 2013–23 adds the one-year window 2022–23, which is provisional. Value-added deflators unless stated. Shares of total growth are not meaningful when total growth is close to zero (producer prices, 2019–22: total 0.35). Firms with at least 5 employees in at least one end-year; market economy.

Figure 2 shows how many percentage points a year resources moving added to productivity growth in each three-year window. The series is volatile: 1.82 points a year in 2004–2007, 0.93 in 2007–2010, 2.01 in 2010–2013, 0.68 in 2013–2016, 1.18 in 2016–2019 and 0.65 in 2019–2022. Part of these swings follows the business cycle and macroeconomic shocks, such as the crisis of 2008–2009 and the years 2020–2022, so a single window says little. We therefore compare averages over long periods. Averaged before and after 2013, the contribution fell by almost half, from 1.6 points a year in 2004–2013 to 0.8 in 2013–2022 (1.7 and 0.8 with producer prices). Every window after 2013 is below the earlier average. The two weakest are 2013–2016 and 2019–2022, the years of the pandemic, the energy shock and the price caps.

Table 1 shows all components before and after 2013 and in the later windows. Growth itself did not collapse: firms improved much faster after 2013 (2.8 points a year against 0.6), so productivity growth since 2013 came mostly from firms improving themselves. As the last rows of the table show, the share of growth that came from resources moving fell from three-quarters (74%) in 2004–2013 to under a quarter (23%) in 2013–2022. This share falls more than the contribution itself, because the total grew.

Three details help to read the numbers. First, firms that leave are less productive than average, and in most windows entrants are not more productive than incumbents, so the gain from entry and exit comes from exit; the exception is 2016–2019, when entry added more (0.44 points) than exit (0.35). Second, between 2004–2013 and 2013–2022 the contribution of resources moving fell by about 0.75 points a year. About half of the fall comes from net entry and exit: weak firms leaving added much less (1.3 points a year before 2013, 0.6 after), only partly offset by entrants that pulled productivity down less. The other half comes from reallocation among continuing firms, mostly from the part that moves employment towards initially productive firms (the between term, 1.1 points a year before 2013 and 0.8 after). Third, the cross term, firms whose

Growth from resources moving almost halved after 2013: from 1.6 to 0.8 points a year

Exit of weak firms and shifts of workers to better firms both added less: each accounts for about half of the fall

TFP rose gaining fewer workers, is about the same on average before and after 2013, but it is most negative in 2019–2022 (−0.95).

The weaker between term means that employment shifted less towards the firms that were already more productive. A negative cross term can mean that workers do not follow productivity gains, but it can also reflect adjustment lags, labour hoarding in a crisis, or measurement error, because employment enters both productivity and the shares. If the cross term is split equally between firms improving and reallocation, the fall in resources moving is about the same size. It fits [Koren and Rátfai \(2026\)](#), who find that the growth advantage of the most productive Hungarian firms has shrunk.⁴ Whether the weakening of 2019–2022 persists once the crisis years pass is an open question; the weak window of 2013–2016 was followed by a recovery. Section 3.5 splits the fall by ownership.

3.4 Exercise 3: how much output is lost to poor allocation?

The last exercise asks how much is at stake. We follow [Hsieh and Klenow \(2009\)](#). Suppose every worker and every forint of capital earned the same return in every firm of an industry. The calculation asks how much more the industry would produce then, with the same total labour and capital. In the model each firm faces its own effective tax or subsidy, on its output or on its capital: a tax rate, an exemption, a regulation, a price cap, cheaper credit or a payment it must make to operate. Firms facing high effective taxes have high returns and are too small; favoured firms have low returns and are too large. What lowers aggregate output is how dispersed these effective rates are across firms, not their average level. The model assumes that firms in an industry sell differentiated products, and it weights industries by their value added. We take the level as a model benchmark and focus on how it changed over time.

We use all market-economy firms with at least five employees, 2004–2023, and show manufacturing separately. As in Hsieh and Klenow, firms with extreme measured productivity are trimmed before the calculation, and these include many of the largest firms. Appendix G gives the formulas and choices and shows how the result depends on trimming.

Figure 3 shows the efficiency gap. In the market economy (purple line) it was 52% of value added in 2004–2010; it rose by about six points by 2016–2019 and by about ten points including 2020–2023. Manufacturing (grey) did not change over the period as a whole. The rise is concentrated in construction, utilities, information and communication, accommodation and food, real estate and trade, and it happened within sectors (Figure 9). Among firms with 20 or more employees in CompNet's industries, which exclude utilities, it rose by four

How much more the same inputs would produce if returns were equal across firms

Firms with 5+ employees, 2004–2023; manufacturing separately

The efficiency gap rose by 6–10 points of value added; manufacturing did not change

⁴ We take snapshots, [Koren and Rátfai \(2026\)](#) look at change. They ask whether firms with higher value added per worker than others in their industry grow faster over the next three years, and find that this growth advantage has shrunk. Exercises 1 and 3 measure how unequal productivity is in a given year. The two are sides of the same mechanism. In a market that works, firms with high revenue productivity grow, and as they grow their revenue per unit of input falls back towards that of their competitors, so the gaps narrow. When productive firms no longer outgrow the rest, the gaps that new shocks create stay open. The between term of Exercise 2, employment shifting towards initially more productive firms, is the aggregate counterpart of their growth advantage, and it also fell after 2013.

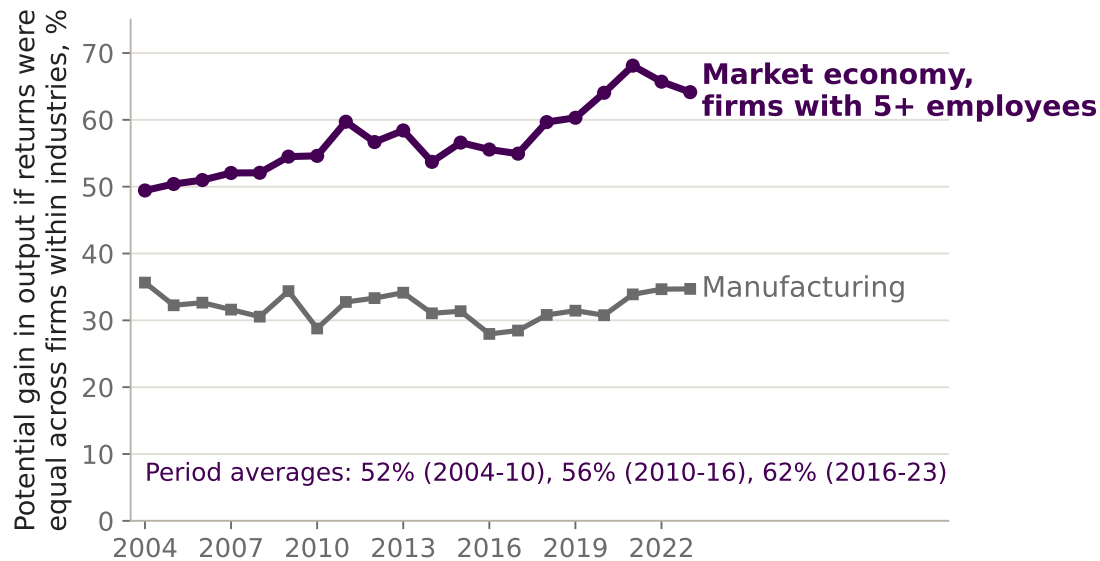


Figure 3: Exercise 3: efficiency gap, the potential gain in output from equalising returns within industries

Notes: Percentage increase in value added if marginal returns to labour and capital were equal across firms within each two-digit industry (Hsieh and Klenow, 2009), $\sigma = 3$, industries weighted by value-added shares, after trimming 1% of each tail. Market economy and manufacturing, firms with five or more employees. Sector detail in Figure 9.

points, and in manufacturing not at all (Table 8): the efficiency gap grew outside manufacturing, and more among firms with 5–19 employees than among larger ones.

A more direct look separates the two inputs. For each firm we compare value added with its capital and with its wage bill, the returns on the two inputs, and measure how unequal these returns are across firms in the same industry. This needs no choice of weights, because the factor shares drop out. Between 2004–2010 and 2010–2016 the spread of returns on capital rose from 1.45 to 1.58 (standard deviation of logs) and then stayed there (1.57 in 2016–2023). The spread of returns on labour did not rise (0.55, 0.53 and 0.53). This is the pattern Gopinath et al. (2017) found in Spanish manufacturing, with similar trends in Italy and Portugal, and Gamberoni et al. (2016) in large euro-area economies: capital became more unevenly allocated, labour did not. The levels of the two spreads cannot be compared, because capital is costly to adjust and returns on it are more dispersed even without distortions (Asker et al., 2014). Only the change is informative, and part of it may reflect more volatile conditions rather than policy. The model itself does not attribute the efficiency gap to either input. Among domestic firms the rise in the efficiency gap is at least as large as overall (Section 3.5).

Capital became more unevenly allocated across firms; labour did not

Exercises 1 and 3 start from the same object: how unequal revenue productivity is across firms in an industry. Exercise 1 measures this spread and compares it across countries. Exercise 3 puts it into a model that says how much output it costs. The two differ in three ways. First, the samples: Exercise 1 covers firms with 20 or more employees in CompNet's industries and weights industries by their number of firms; Exercise 3 covers firms with five or more employees in the market economy and weights industries by value added. Second, the model's gain depends on how dispersed returns are and also on how the dispersion lines up with firms' underlying productivity. Third, Exercise 3 has no comparison with

Exercise 3 translates the productivity gaps of Exercise 1 into output, for a wider set of firms

Poland.

The two agree where they overlap. Among firms with 20 or more employees in CompNet's industries, the sample of Exercise 1, the efficiency gap rose by only four points, and in the main sample the spread of revenue productivity itself hardly changed (Appendix G). This matches Exercise 1, where the Hungarian gap stayed wide but did not widen. The larger rise in Exercise 3 comes from smaller firms, from industries outside manufacturing and from how the effective taxes line up with productivity. Hence Exercise 1 shows that the gaps did not close, and Exercise 3 shows what such gaps cost and that this cost rose.

A useful benchmark is Hungary's own past. If the efficiency gap returned to its 2004–2010 average, the same workers and capital would produce 1–2% of GDP more. We call this the *reserve*. This is a one-off rise in the level of output, which then persists, not extra growth every year. If it took five years to reach, it would add 0.2–0.4 percentage points to growth a year over those five years.

The figure is sensitive to the model's choices and to the years compared, so we read it as a magnitude rather than a precise number. The band of 1–2% covers the comparison with the pre-pandemic years 2016–2019 (1.0–1.5% of GDP in the main specification) and the lower part of the comparison with 2016–2023 (1.7–2.5%), which includes the crisis years and the provisional 2023 data. The 2023 data matter less here than in Exercise 2, because the model compares firms within the same year, but 2023 also sets the value-added base. Appendix G gives the full range and its limitations.

Gradzewicz (2026) finds with the same method that the efficiency gap in Poland also rose, from close to 40% of value added in the 1990s to 70–75% in the early 2020s. This measure therefore does not show the contrast between Hungary and Poland of Exercise 1, and the rise over time cannot be read as specific to Hungary. The two Polish results, narrowing gaps and a rising efficiency gap, use different samples and definitions, and we cannot reconcile them; this is one more reason to read Exercise 3 as a magnitude. The studies differ in samples and assumptions, so their levels are not comparable.

Back to the 2004–2010 allocation:
output 1–2% of GDP higher, a
one-off rise that persists

Poland's efficiency gap rose too:
read Exercise 3 as a magnitude

3.5 Foreign-owned and domestic firms

Foreign-owned firms employ 37–39% of the workers in our sample of firms with five or more employees. Is weak allocation a problem of domestic firms, often small ones, or does it affect foreign-owned firms too? Table 2 splits both the contribution of resources moving (Exercise 2) and the efficiency gap (Exercise 3) by ownership.

Because each term of the decomposition is a sum over firms, the contribution of resources moving splits exactly into a part that comes from foreign-owned firms and a part that comes from domestic firms (Panel A). Before 2013 foreign-owned firms contributed 0.6 points a year and domestic firms 1.0; after 2013, 0.15 and 0.7. The contribution of foreign-owned firms fell by three-quarters, that of domestic firms by under a third. About 60% of the fall (0.47 of 0.75 points) therefore comes from foreign-owned firms, more than their share of employment, and their contribution after 2013 is below its 2004–2007 and

Weak allocation is not only a
problem of domestic firms

Among foreign-owned firms the
contribution of resources moving
fell by three-quarters

Table 2: Foreign-owned and domestic firms: resources moving (Exercise 2) and the efficiency gap (Exercise 3)

<i>A. Exercise 2: contribution of resources moving, percentage points a year</i>			
	2004–13	2013–22	Change
All firms	1.58	0.84	–0.75
of which foreign-owned firms	0.62	0.15	–0.47
of which domestic firms	0.96	0.68	–0.28
Domestic firms only, separate decomposition	1.50	1.12	–0.38
Employment share of foreign-owned firms, %	37	39	
<i>B. Exercise 3: efficiency gap, % of value added</i>			
	2004–10	2016–19	2016–23
All firms	52	58	61
Domestic firms	49	58	61

Notes: Panel A: reallocation plus net entry and exit as in Table 1, averages of three three-year windows. The foreign and domestic parts add up to the value for all firms. Domestic firms only: the decomposition redone without foreign-owned firms. Employment share of foreign-owned firms at the start of each window. Ownership is measured at the start of each window, for entrants at its end. Panel B: efficiency gap as in Figure 3, period averages, firms with 5+ employees; both rows cover the industries of the domestic sample and weight them by their value-added shares in the full sample.

2010–2013 levels in every window. Redoing the decomposition on domestic firms only, the contribution fell from 1.5 to 1.1 points a year, by about a quarter.

Panel B compares the efficiency gap. With the same industries and industry weights, the efficiency gap among domestic firms rose from 49% of their value added in 2004–2010 to 58% in 2016–2019 and 61% in 2016–2023; for all firms it was 52%, 58% and 61%. Domestic firms start from a slightly smaller gap and end at the same level, so the rise among them is at least as large as overall. With the domestic firms' own industry weights the rise looks larger (49% to 64%), but that reflects where domestic value added is concentrated, not a difference within industries.

So allocation weakened in both groups, in different ways. Among foreign-owned firms the flow nearly stopped (0.15 points a year after 2013), and [Koren and Rátvai \(2026\)](#) find that their employment growth advantage over domestic firms that do not export has disappeared. Part of this is the end of the expansion of foreign-owned firms before the crisis ([Muraközy et al., 2018](#)). Part of it may come from policy, because foreign-owned firms were on both sides of firm-specific measures. The sector-specific special taxes introduced after 2010, in retail, telecommunications, energy and banking among others, were designed in a way that allowed discrimination against foreign-owned taxpayers ([Varju and Papp, 2022](#)). At the same time, since 2012 the government has signed strategic cooperation agreements with 100 large companies, nine in ten of them foreign-owned ([HIPA Hungarian Investment Promotion Agency, 2025](#)). Both kinds of measure make how a firm is treated depend on who it is rather than on general rules. Among domestic firms the flow slowed less, but the efficiency gap widened at least as much as overall. Our data do not show which measures, if any, caused these changes.

For policy, this suggests that equal treatment matters for foreign-owned firms as much as for domestic ones: special taxes that single out some firms, and agreements or subsidies that favour others, both make effective tax rates differ across firms in the same industry. Ownership is measured at the start of each window, for entrants at its end. The ownership data change source in 2015 and again after 2020, so we read the split as indicative.

Among domestic firms the efficiency gap rose at least as much as overall

Foreign-owned firms were on both sides of firm-specific measures

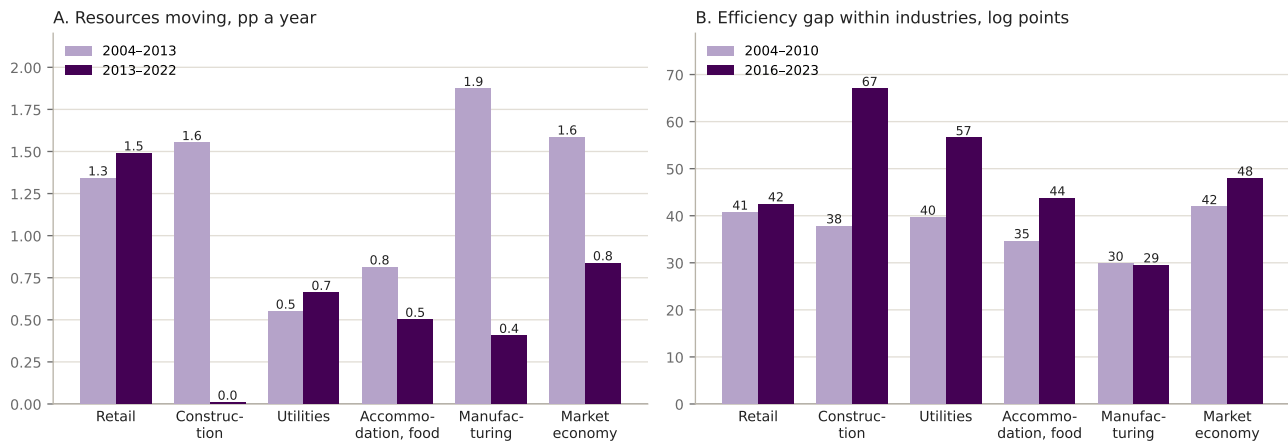


Figure 4: Four industries: contribution of resources moving and the model's efficiency gap

Notes: Panel A: reallocation plus net entry and exit (Exercise 2, main specification), annual percentage points, two-digit industries weighted by their employment, averages of the three-year windows before and after 2013. Panel B: $\ln(TFP^{eff}/TFP)$ within two-digit industries (Exercise 3, main specification), log points, weighted by value added, period averages. Retail: NACE 47; construction: 41–43; utilities: 35–39; accommodation and food: 55–56; manufacturing: 10–33. Firms with five or more employees.

3.6 Four industries

Policy makers want to know where the problem is. Figure 4 shows Exercises 2 and 3 for four industries with heavy sector-specific intervention since 2010, such as special taxes, regulated prices, price caps and public procurement: retail, construction, utilities, and accommodation and food. They were chosen before the results were computed. Manufacturing and the market economy are shown for comparison.

Figure 4 compares the earlier period (light bars) with the later one (dark bars). Panel A is the contribution of resources moving to productivity growth (higher is better); Panel B is the model's efficiency gap (higher is worse). The efficiency gap rose most in construction (38 to 67 log points) and utilities (40 to 57), less in accommodation and food (35 to 44), and hardly at all in retail (41 to 42) and manufacturing (30 to 29). The contribution of resources moving is noisier at the level of an industry, because the three-year windows swing widely, sometimes from positive to negative. Two patterns are clear. In construction it fell from 1.6 points a year to about zero, and in manufacturing from 1.9 to 0.4. In retail it did not fall (1.3 and 1.5),⁵ and in utilities and in accommodation and food the windows vary too much to read a trend.

Construction is the industry where both measures deteriorated. Manufacturing shows the other combination: resources moved much less after 2013, but the efficiency gap, measured within the year, did not widen.

The gap rose most in construction and utilities, hardly in retail and manufacturing

Construction: both measures got worse

4 Putting it together

In this section, we put the three exercises together: what each found and how the findings fit together.

⁵ Muraközy et al. (2018, Chapter 8) found weaker reallocation in retail after 2010 than before the crisis. With our split at 2013 we see no further decline after 2013. Section 5 returns to retail.

Table 3: What each exercise measures, and what it does not tell us

	What it measures	What it does not tell us
Exercise 1: gaps	How far productivity differs between firms in the same industry, compared with Poland and the region (firms with 20+ employees; Poland and the region to 2019)	Whether the gaps come from policy, from prices and markups, or from measurement
Exercise 2: reallocation	How much of productivity growth came from workers moving between firms and from firms entering and leaving the sample (5+ employees)	Why workers moved less, or how capital moved
Exercise 3: size	What a standard model says the same inputs would produce if returns were equal across firms, and how this changed	The effect of any specific policy change

Exercise 1: gaps between firms stayed wide. By the late 2010s productivity gaps within industries were wider in Hungary than in Poland and the CEE region, and Poland's were close to the level of the old member states. In Hungary the gaps did not narrow in 2020–2023.

Exercise 2: resources moved less. Reallocation and net entry and exit added 1.6 percentage points a year to productivity growth in 2004–2013 and 0.8 in 2013–2022, with the weakest windows in 2013–2016 and 2019–2022. About half of the fall comes from weak firms leaving adding less, and half from employment shifting less towards more productive firms. About 60% of the fall comes from foreign-owned firms; among domestic firms alone the contribution fell by about a quarter.

Exercise 3: the reserve is sizeable. The model's efficiency gap is about six points of value added higher in 2016–2019 than in 2004–2010, and about ten points higher including 2020–2023, within sectors and outside manufacturing, most in construction and utilities, and at least as much among domestic firms as overall; returns on capital became more uneven across firms. Returning to the 2004–2010 allocation would raise the level of output by 1–2% of GDP, or 0.2–0.4 percentage points of growth a year over five years.

Table 3 summarises what each exercise measures and what it does not tell us.

Exercise 2 measures a flow: how much productivity growth comes from workers and capital moving between firms. Exercises 1 and 3 measure a state: how far apart firms are, and how far allocation is from efficient, in a given year. The two can move differently, and they did.

The flow weakened after 2013, most among foreign-owned firms; among domestic firms it slowed by about a quarter (Section 3.5).

The state deteriorated. The model's efficiency gap rose, among domestic firms at least as much as in the economy as a whole, most in construction and utilities, and returns on capital became more uneven across firms. Exercise 1 shows that the reallocation that did happen was not enough to bring Hungary's gaps down to Poland's level. We do not observe Poland's reallocation flow, so we cannot say whether resources moved faster there or whether less new dispersion was created.

Together the exercises suggest that workers moved less towards more productive

One finding from each exercise

Resources moved less, and misallocation became more costly

firms after 2013, that returns on capital became more uneven across firms, and that the efficiency gap grew. Section 3.5 shows how these results differ by ownership.

5 Policy discussion

The question we started from is whether there are resources in the Hungarian economy that better policy could mobilise without new spending. Our results suggest that there are. Hungary has productive firms; the problem is that they do not grow enough at the expense of less productive ones.

In an economy with gaps as wide as Hungary's, workers and capital would produce more in the firms that use them best. The benchmark above gives the order of magnitude at stake if allocation merely returned to where it was fifteen years ago. Reaching it takes time, because moving resources has adjustment costs, and it depends on the policy environment more than on any single measure.

Our evidence does not identify which policy slowed reallocation. The literature says which kinds of policy can. Restuccia and Rogerson (2008) showed that taxes and rules that treat firms differently by identity rather than by general criteria lower aggregate productivity even when no firm becomes less efficient. Andrews and Cingano (2014) linked allocative efficiency to product market regulation, employment protection and barriers to entry. Andrews et al. (2017) showed that weak firms that survive on soft financing crowd out productive ones.

In the language of Exercise 3, anything that makes the effective tax rate differ across firms in the same industry adds to the loss: taxes and exemptions tailored to particular firms or groups, discretionary subsidies and procurement, and corruption, which works like a tax that some firms pay and others do not. With firm-level data from Uganda, Fisman and Svensson (2007) found that a one percentage point higher bribery rate was associated with about three percentage points lower firm growth, roughly three times the effect of taxation.

Retail trade is a Hungarian example that has been studied in detail. Muraközy et al. (2018, Chapter 8) found that before the 2008 crisis productivity growth in retail came mainly from reallocation, chiefly through entry and the expansion of large chains, many of them foreign owned. This stopped after 2010, and the contribution of reallocation fell; they suggest that this may be related to the size-dependent measures introduced after 2010, such as the crisis taxes on retail.

The Hungarian pattern, with gaps between firms wider than in Poland on every measure (Exercise 1 and Appendix D), returns on capital becoming more uneven across firms, and an efficiency gap that grew most in construction and utilities but not in exposed manufacturing (Exercise 3 and Section 3.6), is consistent with these mechanisms: an environment in which the growth of firms depends on factors other than their productivity.

Hungary has productive firms; they do not grow enough

Rules that treat firms unequally lower aggregate productivity

Retail: earlier work found reallocation stopped after 2010

Three principles follow, none requiring public money. First, rules should apply equally to all firms and be stable, so that firms grow because they are productive, not because they are favoured. This holds for foreign-owned firms too: some sector-specific taxes allowed discrimination against them, while nine in ten strategic agreements with the government were signed with foreign-owned companies (Section 3.5). Second, measures that change margins in particular industries, such as price caps and sector-specific taxes, should be temporary by design and reviewed against their effect on allocation. Third, entry and exit should be open: in our data most of the contribution of entry and exit comes from weak firms leaving, and this contribution fell from 1.3 percentage points a year before 2013 to 0.6 after. The literature on weak firms kept alive by soft financing (Andrews et al., 2017) describes one way this can happen; our data do not show whether it did.

Equal and stable rules, temporary sector measures, open entry and exit

A last point concerns the composition of growth. Much of economic policy aims at growing the capital stock, including through support for firms' investment. Reallocation works through a different channel: it raises total factor productivity, the output obtained from given inputs. Hence growth from better allocation can continue even if support aimed at growing the capital stock is reduced. If capital and labour flow to the firms that use them best, the economy can grow faster on the same, or a smaller, investment budget.

Growth from better allocation does not need more investment

Recommendations

1. Less intervention in which firms grow means growth through productivity

- If economic policy intervenes less in which firms grow, growth should come increasingly from total factor productivity, as workers and capital move to the firms that use them best.
- The stake is sizeable. Returning to the allocation of 2004–2010 would raise output by 1–2% of GDP: a one-off rise in the level of output that then persists, or 0.2–0.4 percentage points of growth a year over five years.
- This growth needs no public money and comes on top of what investment brings. It can continue even if support for investment is reduced.
- It comes gradually, because moving resources takes time, so it should be tracked. The gaps between firms, the contribution of resources moving and the efficiency gap can be updated every year from firm balance sheets; the central bank's productivity report does not cover them.

2. Policies that help

Our evidence does not identify which policy slowed reallocation; the list follows the research reviewed in this section and in Appendix A.

Stop or scale back

- Taxes, exemptions and special levies that apply to some firms or sectors but not to their competitors
- Discretionary subsidies and individual agreements with selected firms
- Discretionary procedures in public procurement where open tendering is possible
- Price caps and margin rules kept in place after the emergency that justified them
- Soft financing that keeps weak firms alive

Do more of

- Rules that apply equally to all firms, domestic and foreign-owned, and that stay stable
- A time limit and a review of every sector-specific measure, judged by its effect on allocation
- Open entry: fewer regulatory barriers, especially in services and network industries
- Faster exit: insolvency and restructuring rules that free the capital tied up in weak firms
- Where support is given, criteria that any firm can meet, for example for research and development or for smaller firms

6 Caveats

Finally, let us point out the limits of our evidence.

We document how allocation changed, but we cannot tell which policy, if any, caused the change. Each exercise also leaves questions open, as Table 3 shows. Gaps in revenue productivity can reflect prices, markups and measurement as well as misallocation, and the model behind Exercise 3 is a benchmark, not an estimate of what a reform would deliver.

The evidence is descriptive: it cannot say which policy caused the change

Some results are robust: the gap to Poland and the old member states in the late 2010s, the fall in the contribution of resources moving between 2004–2013 and 2013–2022 in every specification we tried, and the sectoral pattern of the model's efficiency gap. The level of the efficiency gap is large in every specification, but it remains a model benchmark rather than an estimate of the output lost.

The gap to Poland and the fall in reallocation are robust; trends and magnitudes less so

Other results are less robust. The Hungary–Poland *trend* contrast depends on the measure, and so does any split between labour and capital (Appendix D). The decline in reallocation is volatile from window to window, and its size differs across methods (it is larger with the Melitz–Polanec decomposition). A similar rise in the efficiency gap is reported for Poland. The size of the reserve depends on the model's choices and on the period compared. Finally, the ownership data change source in 2015 and after 2020, so the split by ownership is indicative.

Several results lean on 2020–2023: the weak reallocation window of 2019–2022 and much of the rise in the efficiency gap. These were the years of the pandemic, the energy shock and the price caps, and the 2023 data are provisional. Data for 2024 will be added soon. They will help to tell whether the weakening persists once the crisis years pass or whether, as after 2013–2016, a recovery follows.

2020–2023 were crisis years; the 2024 data will be added soon

Hence our results are consistent with resources, capital in particular, following productivity less than they used to among domestic firms, and with the cost of this having risen, but they do not prove it.

Technical appendix

This appendix reviews the related literature, lists data sources and sample rules, gives the formulas, explains the choices made and the alternatives rejected, and reports robustness checks and the full ranges behind the magnitudes in the main text. The code is organised in three make-based pipelines, one per result, each with a decision log (Appendix H).⁶

A Related literature

The note draws on six groups of studies: the measurement of misallocation, the critiques of that measurement, the decline of reallocation in advanced economies, evidence from Europe and the region, work on Hungary, and studies that link specific policies to allocative efficiency.

Misallocation and the efficiency gap. Restuccia and Rogerson (2008) and Hsieh and Klenow (2009) started the modern literature. Restuccia and Rogerson show in a model that policies which tax some firms and subsidise others lower aggregate productivity even when no firm becomes less efficient. Hsieh and Klenow measure the dispersion of marginal revenue products across plants in China and India and compute how much output would rise if it were removed; this is the calculation of Exercise 3. Restuccia and Rogerson (2017) and Hopenhayn (2014) review the causes and the theory. Bartelsman et al. (2013) show that the covariance between firm size and productivity, a measure of allocative efficiency, differs widely across countries. The decomposition of Exercise 2 goes back to Baily et al. (1992) and Griliches and Regev (1995); we use the version of Foster et al. (2001) and check it with Melitz and Polanec (2015). Foster et al. (2008) show that revenue and physical productivity can differ, which matters because we observe revenue only.

What dispersion does and does not show. A wide spread of revenue productivity need not mean misallocation. Haltiwanger et al. (2018) show that it can also reflect differences in demand and technology that the standard model leaves out. In nine datasets covering 40 countries, Asker et al. (2014) find that an investment model with adjustment costs and volatile productivity accounts for 80–90% of the variation in the dispersion of returns to capital across industries and countries. David and Venkateswaran (2019) split the dispersion of returns to capital into its sources: in Chinese manufacturing, adjustment costs and uncertainty explain a modest share, and most comes from firm-specific factors correlated with productivity, the kind of wedge that policy can create. Bils et al. (2021) correct for measurement error in revenue and inputs; the correction lowers the estimated gain from reallocation by 20% in India and by 60% in the United States. With an EU-wide firm survey, Gorodnichenko et al. (2026) find that part of the measured dispersion reflects firm characteristics and may be compensation for differences across firms rather than a distortion. For this note, these studies imply that we should read the level of the Exercise 3 gain as a benchmark, not an estimate, and that its change over time is more informative than its level.

Declining reallocation and divergence. In the United States, Decker et al. (2017) link the productivity slowdown to weaker allocative efficiency, and Decker et al. (2020) show that firms have become less responsive to their own productivity: productive firms grow less than they used to. This is the closest parallel to the fall in Exercise 2 and to Koren and Rátfai (2026) for Hungary. In OECD data, Andrews et al. (2016) find that the productivity gap between frontier firms and the rest widened, more so in sectors with less extensive pro-competitive product market reforms, and Berlingieri et al. (2017) find that productivity dispersion rose within sectors in 16 countries, driven mainly by the bottom of the distribution (published as Berlingieri et al., 2024). Adalet McGowan et al. (2018) and Andrews

⁶ This is a draft. Work in progress includes: (i) regressions of firms' employment and capital growth on their earlier productivity, by period, to test directly whether resources respond less to productivity than before; (ii) capital-only and labour-only versions of the Hsieh–Klenow calculation, to test inside the model whether the rise in the efficiency gap comes from capital; (iii) a sample bridge showing firms, employment, value added and capital through each filter, and dispersion with frozen factor weights on Hungarian data; (iv) an update of the regional comparison with the 10th vintage of CompNet; (v) generating all numbers in the text directly from the output files.

et al. (2017) show that the capital sunk in zombie firms, old firms that persistently struggle to pay interest, rose from the mid-2000s, and that this goes with lower investment and employment growth of other firms in the industry and weaker reallocation of capital. Andrews and Petroulakis (2019) link zombie firms in Europe to weak banks.

Europe and the region. CompNet, the source of our comparisons, is described by Lopez-Garcia et al. (2015) and CompNet (2021). Using firm data for five large euro-area countries in 2002–2012, Gamberoni et al. (2016) find that the allocation of capital worsened everywhere except Germany while the allocation of labour changed little, and that the deterioration was larger in services than in industry. This is the pattern of our Exercise 3. Calligaris et al. (2018) estimate that Italy's aggregate productivity in 2013 would have been 18% higher had misallocation stayed at its 1995 level; the rise happened within sectors. Dias et al. (2016) find that misallocation within industries in Portugal almost doubled between 1996 and 2011, concentrated in services and on the capital side. Gopinath et al. (2017) link the rise in capital misallocation in Spain to the fall in interest rates after the introduction of the euro. For the region, Giordano and Lopez-Garcia (2018) use CompNet data for nine Central and Eastern European countries, Hungary and Poland among them, for 2003–2012, and find that more corruption goes with more misallocation of both labour and capital, especially where regulation is of lower quality. Grassi (2026) shows that the 2004 joiners narrowed the productivity gaps between their firms towards the level of the old member states, and Gradzewicz (2026) applies the Hsieh–Klenow calculation to Poland. At the level of the EU, the Draghi report attributes the productivity gap to the United States largely to the technology sector (Draghi, 2024); this note looks at a different margin, allocation within industries.

Hungary. Muraközy et al. (2018) give the most detailed decomposition of Hungarian productivity growth before ours and find strong reallocation before 2008 and much weaker reallocation after 2013. Harasztosi (2011) decomposes Hungarian growth in 1994–2008 into capital, labour, productivity and reallocation. Koren and Rátfai (2026) find that the employment growth advantage of the most productive Hungarian firms over the median firm has shrunk steadily since the 1990s, and that the growth advantage of foreign-owned firms has disappeared. The latest OECD surveys reach a similar diagnosis. OECD (2024), citing Muraközy et al. (2018), reports that the within-firm, between-firm and entry and exit contributions to productivity growth all declined since the mid-2000s. OECD (2026) points to low business dynamism, product market regulation that holds back entry, insolvency rules that slow the reallocation of capital towards the most productive firms, and concentration and markups that rose faster than elsewhere in Europe. The central bank's productivity report documents a large gap between foreign-owned and domestic firms, about threefold in 2010–2016 and two-and-a-half-fold in 2021, but does not analyse allocation (Magyar Nemzeti Bank, 2024).

Several studies show how public resources were allocated across Hungarian firms. Exploiting a reform that allowed a more discretionary procedure below a contract-value threshold, Szucs (2024) finds that discretion in public procurement raised prices, selected less productive contractors and favoured firms connected to the governing party. Muraközy and Telegdy (2016) find that EU-funded grants in 2004–2012 favoured municipalities aligned with the governing coalition mainly for projects visible to voters, such as construction. Muraközy and Telegdy (2023) and Banai et al. (2020) find that EU grants to small and medium-sized firms raised employment, sales and capital, but not clearly productivity. Varju and Papp (2022) analyse the sector-specific special taxes from a legal angle and argue that their design allowed discrimination, in particular against foreign-owned firms.

Policies and allocative efficiency. Andrews and Cingano (2014) link allocative efficiency to product market regulation, employment protection and barriers to entry, and Arnold et al. (2008) find that restrictive regulation of services goes with less efficient allocation within industries. Garicano et al. (2016) quantify one size-dependent rule: French labour regulations that bind at 50 employees act like a 2.3% tax on labour and cost 1.3–3.4% of GDP, depending on how flexible wages are. Midrigan and Xu (2014) find that financial frictions cost most through less entry and technology adoption, not through misallocation among incumbents. Fisman and Svensson (2007) find that bribery hurts firm growth more than taxation does. We found no study that links price caps to the allocation of resources across firms.

What this note adds. For Hungary, the note extends the evidence on dispersion and on the sources of productivity growth to 2023, puts Hungary next to Poland and the region on comparable measures, and separates the contributions of foreign-owned and domestic firms.

B Data

Source. Mérleg LTS, version 5.9.0 (November 2025), compiled by KRTK from corporate tax returns (until 2014) and Opten company records (from 2015), with contributions by CEU MicroData. One record per firm and year, 1980–2023, 11.0 million firm-years. The firm identifier (`frame_id`) follows firms through mergers and transformations; when it is missing we use the tax number. Industry codes are harmonised to two-digit NACE Rev. 2 and are year-specific.

Variables. Value added: sales plus capitalised own work minus material costs (`gdp`); for the dispersion measure CompNet's definition, sales minus material costs. Labour: employees (`emp`). Labour cost: payments to personnel including employer contributions (`persexp`). Capital: tangible plus intangible fixed assets, book value. Capital cost: depreciation (`kecs`), and in the version with imputed financing cost also the 10-year government bond yield (Eurostat `irt_lt_mcbby_a`) times equity (`satok`, if positive) and long-term liabilities (`h1k`). Thousand HUF, nominal unless stated.

Sample for Exercise 1. Business entities (company-form codes 1xx), at least 20 employees, CompNet's industries (NACE 10–33 without 19, 41–43, 45–47, 49–53, 55–56, 58–63, 68, 69–75, 77–82), positive sales, value added, capital and materials, 2004–2023. CompNet's outlier routine is applied before the size cut.

Sample for Exercises 2 and 3. Market economy (NACE 05–82 and 95, without 53 and 64–66); firms ever non-profit or budgetary are dropped. An active firm-year has at least one employee and positive value added and capital (Exercise 3 also a positive wage bill). For each window of Exercise 2 we keep firms with at least 5 employees in at least one end-year. Productivity is winsorised at the 1st and 99th percentiles by industry and year, and firms whose log productivity changes by more than 1.5 between consecutive 5+ years are dropped, as in Muraközy et al. (2018). Each three-year window has 34,000–58,000 continuing firms and 8,000–16,000 entrants and exiters.

Coverage. The nominal value added of the Exercise 2 sample is 62–64% of national-accounts gross value added in the same industries in every year 2015–2022 and grows at nearly the same rate (2022: 18.3% against 18.4%). In 2023 it grows by 5.9% against 15.9%. The number of active firms is stable (180,755 against 179,520), but this does not rule out changes in composition; the source of the gap is unknown and 2023 is provisional.

Prices. Value-added price indices by A64 industry and the gross fixed capital formation price index from Eurostat (`nama_10_a64`, `nama_10_gdp`); air transport uses the transport total. Producer price indices are part of the panel. A deflator common to an industry-year cancels from the coefficient of variation in Exercise 1 and from the within-industry efficiency ratio in Exercise 3; firm-specific prices and markups do not cancel.

CompNet. 8th vintage, firms with 20 or more employees, unweighted, two-digit industries, collapsed to country-year by Basile Grassi. Hungary from 2004, Poland from 2002, to 2019 (2018 for most old member states). CEE average: the six 2004 joiners with data, Hungary included. Old member states: nine EU-15 countries with data, shown when at least five report. The 9th vintage was examined and not used: its all-firms sample lacks Poland, and the fixed-weight residual is missing.

GDP and deficit. Nominal GDP 2023: HUF 75,218 billion (Eurostat nama_10_gdp, B1GQ, current prices). General government balance: −7.0% of GDP in 2023, −5.1% in 2024, −4.7% in 2025 (Eurostat gov_10dd_edpt1, April 2026 release). Forecasts for 2026: −7.5% (Ministry of Finance, July 2026 budget review, the basis of the revised 2026 budget submitted in August; *Pénzügyminisztérium, 2026*) and −6.9% (*Magyar Nemzeti Bank, 2026*, September 2026 Inflation Report).

C Exercise 1: method and validation

Firm productivity. For firm i in industry s and year t ,

$$SR_{ist} = \frac{VA_{ist}}{L_{ist}^{\alpha_{st}} K_{ist}^{1-\alpha_{st}}}, \quad (1)$$

where α_{st} is the median across firms in the industry and year of labour cost divided by labour cost plus capital cost. Constant returns. Baseline: capital cost = depreciation. Second version: depreciation + r_t (equity + long-term debt) with r_t the nominal 10-year bond yield, an accounting proxy for CompNet's capital cost, which includes interest paid.

Outliers. CompNet's routine (*CompNet, 2021*): a firm-year is dropped if any of six ratios (sales to labour, labour cost, capital and materials; capital to labour; materials to labour) is in the bottom 3% or top 2% of its industry-year distribution, computed on all firms before the 20-employee cut. This reproduces CompNet's firm counts within 2.5% in 2004–2015.

Dispersion and aggregation. For each industry-year with at least 10 firms, $CV_{st} = \text{sd}(SR)/\text{mean}(SR)$. The yearly value is

$$CV_t = \left(\sum_s N_{st} CV_{st}^2 / \sum_s N_{st} \right)^{1/2},$$

with N_{st} the number of firms (Grassi's aggregation). Regional averages apply the same formula across countries.

Period averages. On our Hungarian series: 0.78 in 2005–2008, 0.73 in 2016–2019 and 0.70 in 2023; Poland 0.80 and 0.62; CEE average 0.76 and 0.64; old member states 0.58 and 0.57. In 2019 the Hungarian value was 0.15 above the Polish one (CompNet's own Hungarian line: 0.69 against 0.58). The version with imputed financing cost is 0.04–0.06 above the baseline in 2009–2013 and 2022–2023.

The implied composite coefficient. CompNet reports mean log labour productivity $E[\ln(VA/L)]$ and mean log Solow residuals with fixed (2/3) and cost-share weights. Since $\ln SR = \ln(VA/L) - (1 - \alpha) \ln(K/L)$,

$$E[\ln(K/L)] = 3 (E[\ln(VA/L)] - E[\ln SR^{2/3}]), \quad \bar{\alpha} = 1 - \frac{E[\ln(VA/L)] - E[\ln SR^{cs}]}{E[\ln(K/L)]}. \quad (2)$$

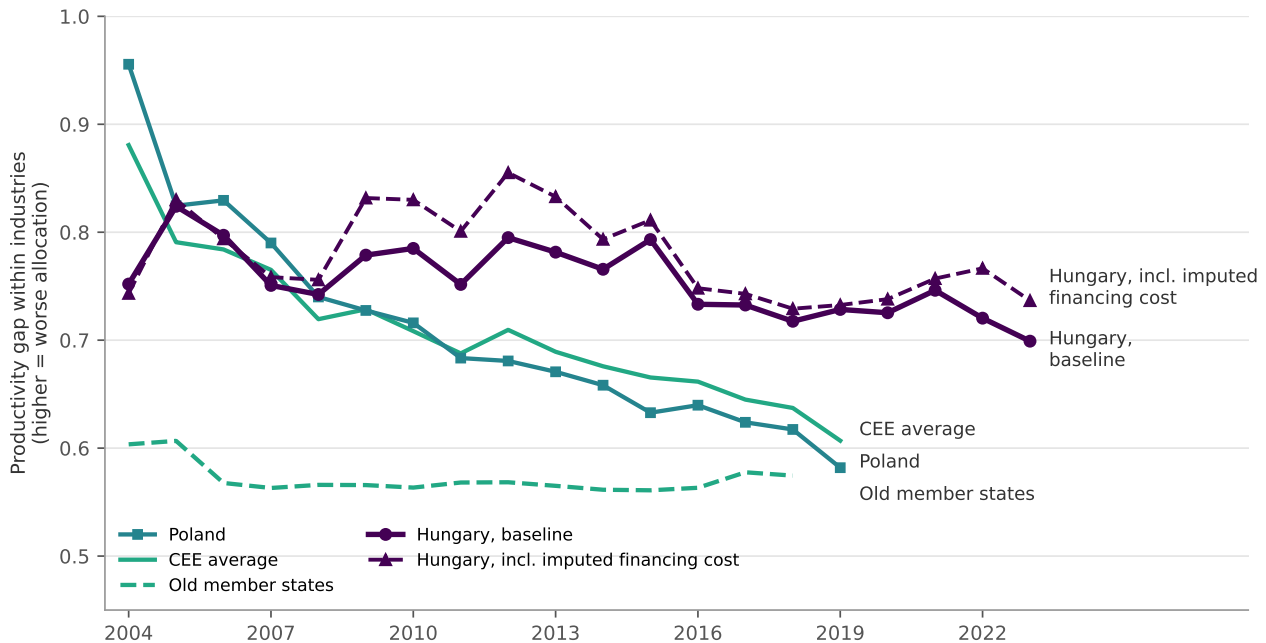
With industry-specific weights $\bar{\alpha}$ is a composite, $E[\alpha_s \ln(K/L)]/E[\ln(K/L)]$, not the average labour share, and it depends on the units of K/L . We use it as a diagnostic only. For Hungary it rises from 0.75 (2004) to 0.84 (2019), for Poland from 0.76 to 0.86. On our data the composite is 0.004–0.007 below the mean weight.

Table 4 shows the check. With fixed weights our series matches CompNet's closely (mean gap −0.009), which validates the sample and data. With cost shares, labour cost over value added fails (correlation 0.16); the two versions we report are within 0.002 (baseline) and 0.024 (imputed financing cost) of CompNet's on average. After 2015 our firm count grows while CompNet's stays flat, and our line is slightly above CompNet's (2019: 0.73 against 0.69); we have not established why.

Table 4: Our Hungarian series against CompNet's, 2004–2019

Labour weight	CompNet series	Mean gap	RMSE	Correlation	Labour-weight gap
Fixed weights, labour 2/3	PV08	−0.009	0.026	0.83	–
LC / VA	PV09	0.084	0.100	0.16	−0.10 [−0.18, −0.05]
LC / (LC + depreciation)	PV09	0.002	0.021	0.86	0.07 [0.03, 0.09]
LC / (LC + depr. + interest)	PV09	0.024	0.037	0.75	−0.02 [−0.04, −0.01]

Notes: Gap = our value minus CompNet's. PV08: CompNet's Solow residual with fixed weights; PV09: with cost shares. Labour-weight gap: our implied composite coefficient minus CompNet's, mean and [range]. Number of firms within 2.5% of CompNet's in every year 2004–2015.

**Figure 5:** Exercise 1 with an imputed financing cost in the cost of capital, 2004–2023

Notes: As Figure 1, with a second Hungarian line in which the cost of capital also includes the 10-year government bond yield times equity and long-term debt. The two Hungarian lines differ by 0.04–0.06 in 2009–2013 and 2022–2023 and are close otherwise.

D Exercise 1 on three productivity measures

Productivity can be measured in more than one way, and the weights given to labour and capital are a choice. This appendix checks whether the comparison of Exercise 1 survives this choice. We compute the same spread with three productivity measures that CompNet publishes for the same firms: labour productivity (value added per employee), TFP with fixed weights (two thirds labour, one third capital), and TFP with cost-share weights, the measure of Exercise 1. We use CompNet's own series for Hungary, Poland, the CEE average and the old member states, and compare the averages of 2005–2008 and 2016–2019 (CompNet, 2021); Figure 6 shows the yearly series.

Levels. Table 5 gives the levels. In 2016–2019 Hungary's gaps were wider than Poland's on all three measures, by 0.09–0.11, and wider than the CEE average by 0.07–0.08. Poland's gaps were close to those of the old member states on all three. This level difference does not depend on how productivity is measured.

Trends. How the difference arose does depend on the measure. On the cost-share measure Hungary and Poland started at about the same level in 2005–2008, and Poland's gaps narrowed much more. On labour productivity Hungary's gaps were already about 0.1 wider in 2005–2008, and both countries narrowed by the same 0.12. With fixed weights neither country changed. So we do not read the comparison as Hungary falling behind Poland. Nor do we take a view on whether the difference lies with labour or with capital: the measures weight the two differently,

Table 5: Three CompNet measures of productivity gaps, period averages

	A. TFP, cost-share weights			B. TFP, fixed weights			C. Labour productivity		
	2005–08	2016–19	Change	2005–08	2016–19	Change	2005–08	2016–19	Change
Hungary	0.78	0.71	–0.08	0.83	0.83	0.00	0.85	0.73	–0.12
Poland	0.80	0.62	–0.18	0.73	0.73	0.00	0.74	0.62	–0.12
CEE average (2004 EU joiners)	0.76	0.64	–0.13	0.76	0.75	–0.01	0.76	0.65	–0.11
Old member states (EU-15)	0.58	0.57	0.00	0.77	0.70	–0.06	0.59	0.60	0.01

Notes: Standard deviation divided by the mean within two-digit industries; CompNet 8th vintage, firms with 20 or more employees, all from CompNet's own series (Hungary is CompNet's Hungarian line, slightly different from ours). Old member states: 2016–2018. Fixed weights: labour 2/3, capital 1/3. Changes are computed from unrounded values.

and the results move with the weights.⁷

Hungary after 2019. CompNet's data end in 2019, so Poland cannot be followed further. For Hungary we can extend all three measures with our own data (Table 6); our labour-productivity series follows CompNet's closely in 2004–2019 (mean gap 0.002, correlation 0.91). Between 2016–2019 and 2020–2023 the gaps hardly changed: from 0.73 to 0.72 on the cost-share measure, from 0.81 to 0.80 with fixed weights and from 0.76 to 0.75 on labour productivity. The narrowing on labour productivity before 2019 did not continue. This has two implications. First, the gap to Poland and the old member states that Exercise 1 shows for 2019 did not close afterwards on the Hungarian side; we cannot see whether Poland's gaps moved. Second, the shocks of 2020–2023 (the pandemic, the energy shock and the price caps) could have pushed resources towards better firms or kept them in place. On these measures the gaps neither narrowed nor widened, so by this yardstick allocation did not improve.

Table 6: Productivity gaps in Hungary on three measures, our own data, 2005–2008 to 2020–2023

	2005–08	2016–19	2020–23	Change to 2016–19	Change to 2020–23
TFP, cost-share weights (Exercise 1)	0.78	0.73	0.72	–0.05	–0.01
TFP, fixed weights (labour 2/3)	0.81	0.81	0.80	0.00	0.00
Labour productivity	0.84	0.76	0.75	–0.08	–0.01

Notes: Standard deviation divided by the mean within two-digit industries, combined as in Figure 1; firms with 20 or more employees in CompNet's industries, own calculation from the Mérleg LTS panel. Cost-share weights: labour cost over labour cost plus depreciation, the Hungarian line of Figure 1. CompNet data, and hence Poland, end in 2019. With 2021–2023 instead of 2020–2023 the values are the same to two decimals. Changes are computed from unrounded values.

Summary. Taken together, the three measures agree that Hungarian firms in the same industry are further apart than Polish firms and firms in the region, and that in Hungary these gaps did not narrow after 2019. They do not agree on when the difference opened, or on whether it lies with labour or with capital. A decomposition of the cost-share measure into labour-productivity dispersion, capital-intensity dispersion and their covariance under frozen weights would separate data changes from weight changes; it can be done on Hungarian data, not on CompNet aggregates.

E Exercise 2: decomposition method and comparison with Muraközy et al. (2018)

Productivity. $tfp_{it} = \ln VA_{it} - \alpha_s \ln L_{it} - (1 - \alpha_s) \ln K_{it}$, with α_s the median over 2004–2023 of labour cost divided by labour cost plus depreciation plus the imputed financing cost, among 5+ firms in industry s (median 0.78, range 0.17–0.97). Fixed over time. Value added deflated by the industry value-added price index, capital by the gross fixed capital formation deflator; the producer-price version deflates both by the industry PPI.

⁷ The cost-share measure weights capital by its share in costs, and as interest rates fell the labour weight rose from about 0.75 to 0.85 in both countries. Changes in this measure therefore mix changes in the data with changes in the weights; CompNet's aggregates cannot separate the two (Appendix C).

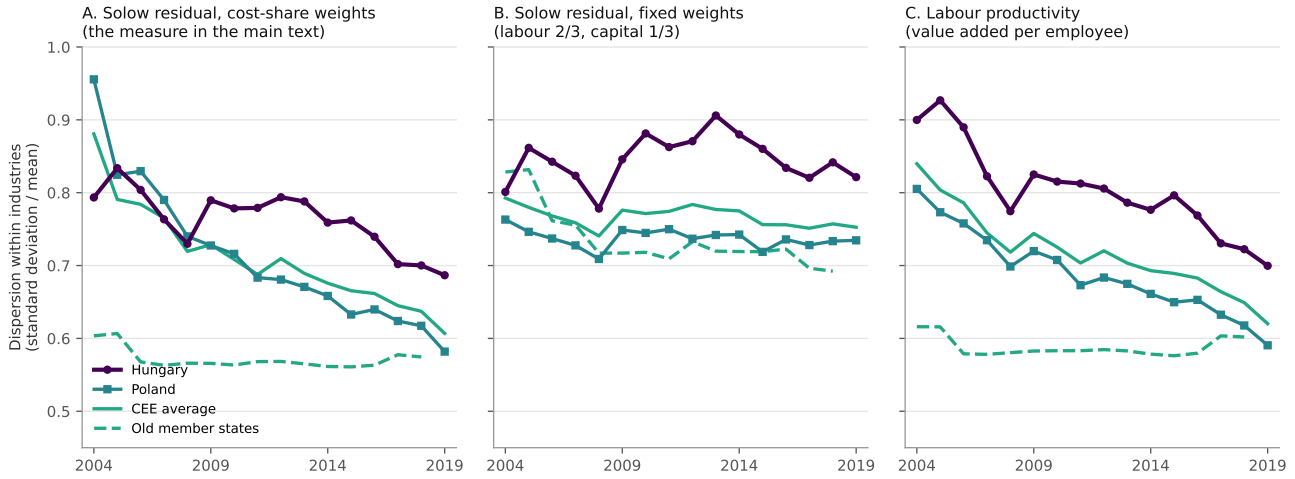


Figure 6: Three CompNet measures of productivity gaps, 2004–2019

Notes: As Table 5, yearly values. Hungary is CompNet's own line.

Decomposition. Between years a and b , in industry s , with employment shares θ_{it} and $P_t = \sum_i \theta_{it} t f p_{it}$,

$$\begin{aligned}
 P_b - P_a &= \sum_{i \in C} \theta_{ia} \Delta t f p_i && \text{(within)} \\
 &+ \sum_{i \in C} (t f p_{ia} - P_a) \Delta \theta_i && \text{(between)} \\
 &+ \sum_{i \in C} \Delta t f p_i \Delta \theta_i && \text{(cross)} \\
 &+ \sum_{i \in N} \theta_{ib} (t f p_{ib} - P_a) && \text{(entry)} \\
 &- \sum_{i \in X} \theta_{ia} (t f p_{ia} - P_a) && \text{(exit)}
 \end{aligned} \tag{3}$$

C , N and X are continuing, entering and exiting firms of industry s . A firm active at both ends but in different industries is an exiter from one and an entrant into the other: 765–5,578 firms per window, 17–41% of entrants and 17–35% of exiters. The terms add up exactly (asserted in the code). Industry terms are aggregated with the average of the industry's employment share at a and b . Windows: 2004–07, 2007–10, 2010–13, 2013–16, 2016–19, 2019–22, 2022–23; values divided by window length; period values are averages weighted by length.

The cross term. Productivity contains $-\alpha_s \ln L$, so a firm that adds workers before output follows, or whose employment is mismeasured, shows a negative co-movement of productivity and share. A negative cross term is therefore consistent with resources not following productivity gains, but also with adjustment lags and measurement error. As a sensitivity we split it equally: within + cross/2 and between + cross/2.

Comparison with Muraközy et al. (2018). Their Figure 6.3 shows the same decomposition for 2004–2016. Our version differs in four ways. (i) We decompose within industries: with industry-specific weights, TFP levels of different industries are on different scales. Measuring capital in million instead of thousand forints shifts each firm's TFP by $(1 - \alpha_s) \ln 1000$; the within-industry results do not move, while the pooled 2004–2010 reallocation term moves from 1.50 to 0.97. Hence we decompose within industries, where the result does not depend on units. (ii) Entry and exit are defined by presence in an industry's sample, not by crossing the 5-employee line. (iii) Cost-share weights rather than estimated production functions (Akerberg et al., 2015). (iv) Data to 2023 and two price indices. With their sample and pooling, our 2004–2010 reallocation term is 1.50 against their 1.48.

Why employment shares. With value-added TFP, value-added shares and the productivity measure share the same measurement error, which inflates the cross term (3.5 points a year in 2004–2010 in our data).

F Exercise 2: robustness

Table 7: Robustness of the decomposition: resources moving (reallocation + net entry and exit), annual percentage points

	04–13	13–22	13–16	16–19	19–22	13–23
Main: within industries, value-added deflators	1.58	0.84	0.68	1.18	0.65	0.67
Producer price index deflators	1.68	0.77	0.80	1.15	0.36	0.66
Labour weight: LC / (LC + depreciation)	1.54	0.80	0.57	1.21	0.63	0.61
Entry = crossing 5 employees (MRB sample)	1.81	1.07	0.73	1.48	1.00	0.89
Firms changing industry dropped	1.80	0.79	0.72	1.06	0.60	0.64
Melitz–Polanec (2015)	2.02	–0.10	0.47	0.37	–1.15	–0.19
Main, cross term split equally (between + cross/2 + net entry)	1.85	1.14	0.90	1.38	1.13	1.01

Total productivity growth, same specifications

	04–13	13–22	13–16	16–19	19–22	13–23
Main: within industries, value-added deflators	2.14	3.67	2.53	5.13	3.36	2.43
Producer price index deflators	2.34	2.95	3.41	5.09	0.35	2.55
Labour weight: LC / (LC + depreciation)	2.22	3.65	2.65	5.38	2.92	2.41
Entry = crossing 5 employees (MRB sample)	2.20	3.67	2.51	5.14	3.37	2.44
Firms changing industry dropped	2.29	3.72	2.64	5.15	3.36	2.47
Melitz–Polanec (2015)	2.14	3.67	2.53	5.13	3.36	2.43

Notes: 04–13 and 13–22 average three windows each; 13–16, 16–19 and 19–22 are single windows; 13–23 adds the one-year 2022–23 window. Labour weight: without the financing cost. MRB sample: firm-years with 5+ employees, so crossing the line counts as entry or exit. Firms changing industry dropped: such firms removed from both ends of each window. Melitz–Polanec: reallocation = change in the size–productivity covariance among survivors.

Table 7 shows six specifications and the equal split of the cross term; Figure 7 shows the reallocation term alone. The contribution of resources moving is lower in 2013–2022 than in 2004–2013 in every specification, and lower in 2019–2022 than in 2016–2019 in every one. Figure 8 shows all components with both price indices. Dropping firms that change industry raises the early contribution (1.80 in 2004–2013) and leaves the later one nearly unchanged (0.79). The equal split of the cross term leaves the decline about the same size (1.85 to 1.14). Total growth depends on the price index after 2019: with producer prices the 2019–2022 window grows 0.4% a year, with value-added prices 3.4%.

The 2022–2023 window. With value-added deflators this one-year window has within-firm growth of –7.9 points and a total of –8.8; with producer prices –0.7 and –1.1. The national-accounts price of value added rose by 16–19% in 2023 while our firms’ nominal value added grew by 6%. Reallocation and exit are nearly the same under both deflators, so the problem affects the within term and the total, not the finding about reallocation.

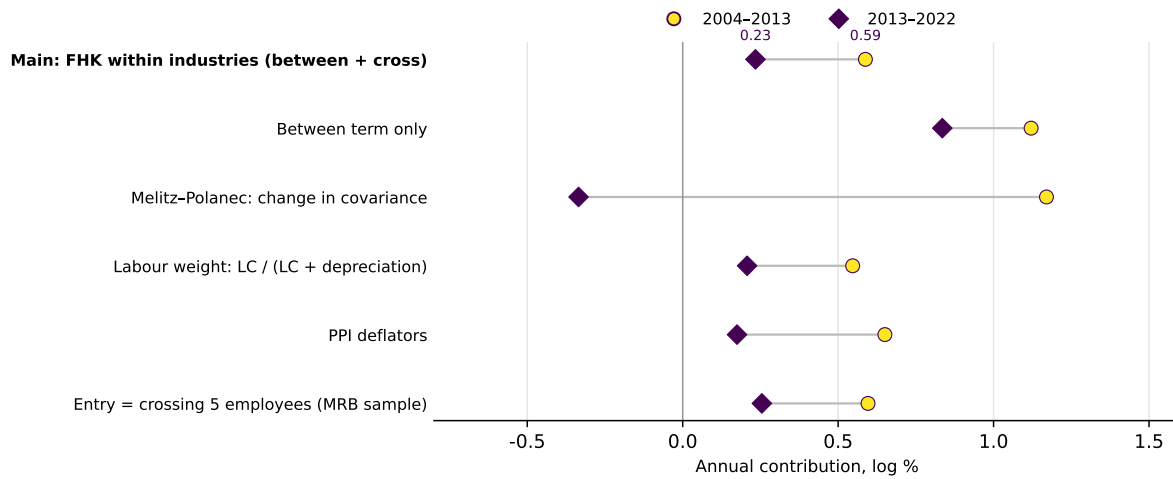


Figure 7: Reallocation by method, before and after 2013

Notes: The reallocation term (between + cross; Melitz–Polanec: change in covariance) by specification, annual percentage points, averages of the three-year windows in 2004–2013 and 2013–2022. The figure also shows the between term alone, which is not in Table 7.

G Exercise 3: Hsieh–Klenow calculation

Method. Following Hsieh and Klenow (2009, Section IV), for firm i in two-digit industry s and year t , with value added PY_i , capital K_i , wage bill wL_i and capital share α_s :

$$TFPR_i = \frac{PY_i}{K_i^{\alpha_s} (wL_i)^{1-\alpha_s}}, \quad A_i \propto \frac{PY_i^{\sigma/(\sigma-1)}}{K_i^{\alpha_s} (wL_i)^{1-\alpha_s}},$$

$$\overline{TFPR}_s = \frac{\sum_i PY_i}{(\sum_i K_i)^{\alpha_s} (\sum_i wL_i)^{1-\alpha_s}}, \quad A_s = \left(\sum_i A_i^{\sigma-1} \right)^{\frac{1}{\sigma-1}},$$

$$\frac{TFP_s}{TFP_s^{\text{eff}}} = \left[\sum_i \left(\frac{A_i}{A_s} \frac{\overline{TFPR}_s}{TFPR_i} \right)^{\sigma-1} \right]^{\frac{1}{\sigma-1}},$$

$$\frac{Y^{\text{eff}}}{Y} = \prod_s \left(\frac{TFP_s^{\text{eff}}}{TFP_s} \right)^{\theta_s},$$

with θ_s the industry's share in value added. The efficiency gap is $100 (Y^{\text{eff}}/Y - 1)$, computed year by year in nominal terms, $\sigma = 3$ as in Hsieh and Klenow. In the model a firm's $TFPR$ is high when it faces a tax-like distortion that keeps it small and low when it is favoured and too large. Misspecified technology, measurement error and demand assumptions also create $TFPR$ dispersion (Haltiwanger et al., 2018), so the efficiency gap is a frictionless-model benchmark, not a bound on the true gain in either direction.

Choices. $\alpha_s = 1 - \text{median}[wL/(wL + D + r_t E)]$ over 5+ firm-years in the industry, 2004–2023 (median α_s 0.22), with D depreciation and E equity plus long-term debt; this is the same weight as in Appendix E. Here, following Hsieh and Klenow, α_s is the capital share, one minus the labour weight denoted α in Appendices C and E. Hsieh and Klenow use US industry shares, not available at this level. Industries are two-digit (they use four-digit); coarser industries usually raise the measured gain, so levels are not comparable with theirs. Following them we trim the top and bottom 1% of $\ln(TFPR_i/\overline{TFPR}_s)$ and of $\ln(A_i M_s^{1/(\sigma-1)}/A_s)$ each year and recompute; industry-years with fewer than 10 firms are dropped.

Levels. Efficiency gap in the main sample, period averages: 52% of value added in 2004–2010, 56% in 2010–2016, 58% in 2016–2019 and 62% in 2016–2023 (peak 68% in 2021). Firms with 20+ employees in CompNet's industries: 42% to 46%. Manufacturing: 31–32% throughout. Gaps within sectors (log points, 2004–10 to 2016–23):

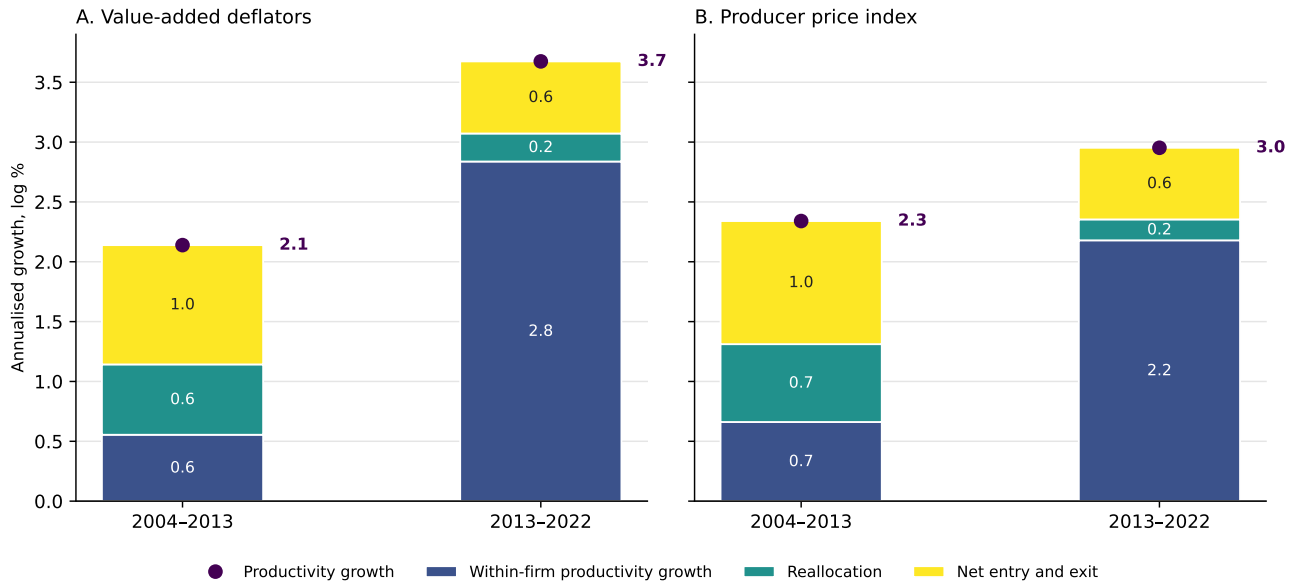


Figure 8: Exercise 2: all components of productivity growth before and after 2013, two price indices

Notes: As Table 1, 2004–2013 and 2013–2022. Panel A: industry value-added price indices from the national accounts (Eurostat, 2026). Panel B: industry producer price indices.

construction 38 to 67, utilities 40 to 57, information and communication 30 to 42, accommodation and food 35 to 44, real estate 77 to 91, trade 60 to 68; slight falls in transport and administrative services.

Table 8: Efficiency gap, period averages

Efficiency gap, %	2004–2010	2010–2016	2016–2023
Market economy, 5+ employees (main)	52.0	56.5	61.6
CompNet industries, 20+ employees	42.2	45.9	46.2
Manufacturing, 5+ employees	32.3	31.3	31.6
Market economy, $\sigma = 5$	74.9	85.0	97.3
Market economy, capital cost without interest	43.0	45.3	50.0

Notes: Values of Figure 3 averaged over the years shown; the bottom rows vary the elasticity of substitution and the capital share.

From the efficiency gap to the reserve. The benchmark used in the main text is $(1 + g_{\text{later}})/(1 + g_{2004-10}) - 1$: the proportional increase in output if the model's efficiency ratio returned to its 2004–2010 average, holding the later frontier fixed. In the main specification it is 6.3% of value added with 2016–2023 as the later period (6.2% from period averages of the log gain). It is an output-level difference, not an annual growth rate, and it does not restore the historical allocation firm by firm or model the transition.

To express it relative to GDP it has to be applied to a value-added base. The trim removes about 3% of firms but 31–44% of value added, depending on the year, because the top tail of the A_i deviation contains many of the largest firms. In 2023 the calculation keeps 60,935 of 62,857 firms and HUF 20,113 of 29,979 billion of value added. Applied to the firms kept, 6.3% is HUF 1,264 billion, 1.7% of 2023 GDP. Applied to all firms with 5+ employees, which assumes that the excluded firms would improve in the same proportion, it is HUF 1,884 billion, 2.5% of GDP.

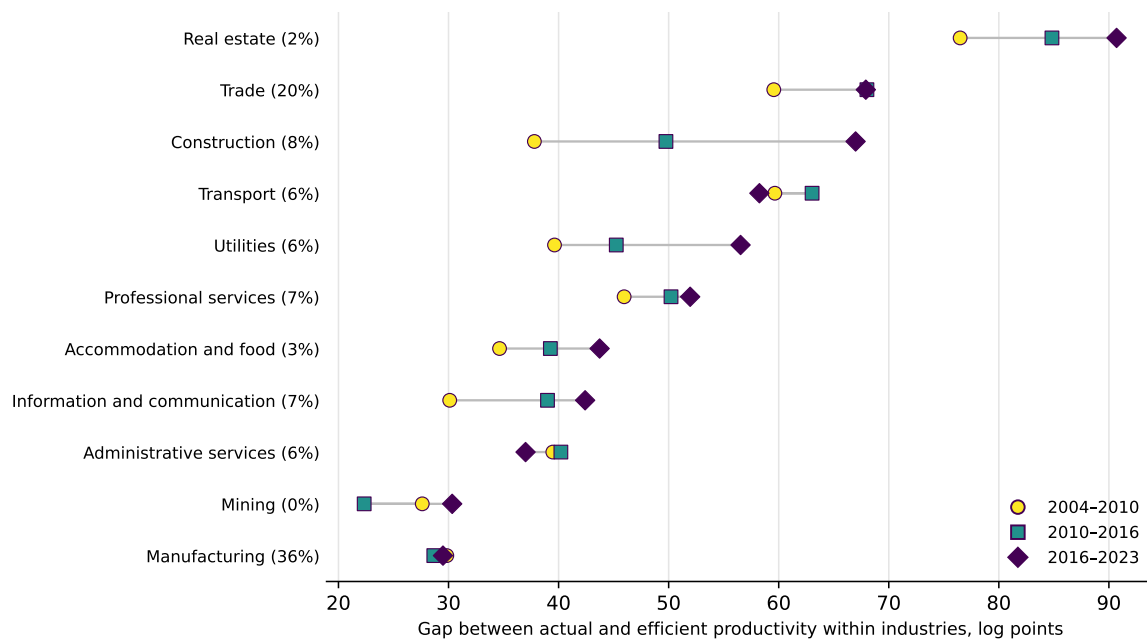
Sensitivity. Table 9 shows the benchmark and its GDP share across variants. With 2016–2023 as the later period it ranges from 0.8% to 5.1% of GDP. It is above 1% of GDP in all variants except the 2% trim applied to the firms kept. With only the pre-pandemic years 2016–2019 as the later period it is smaller and more fragile, 0.2–2.0% of GDP, because the efficiency gap rose most in 2020–2023. Without trimming, a few extreme firms drive the level of the efficiency gap to about 200%, though the benchmark is similar (6.7%). For firms with 20+ employees in CompNet's industries the benchmark is 2.8% of their value added; in manufacturing alone it is about zero (–0.5%).

Table 9: The return-to-2004–2010 benchmark across specifications, as a share of value added and of GDP

Variant	2016–2023 vs 2004–2010			2016–2019 vs 2004–2010		
	Benchmark % of VA	% of GDP kept firms	all 5+ firms	Benchmark % of VA	% of GDP kept firms	all 5+ firms
Trim 1% (main)	6.3	1.7	2.5	3.7	1.0	1.5
No trimming	6.7	2.6	2.7	0.6	0.2	0.3
Trim 0.5%	8.7	2.6	3.5	5.1	1.5	2.0
Trim 2%	3.6	0.8	1.4	1.5	0.4	0.6
$\sigma = 5$	12.8	–	5.1	–	–	–
Capital cost without financing cost	4.9	–	1.9	–	–	–

Notes: Benchmark: $(1 + g_{\text{later}})/(1 + g_{2004-10}) - 1$, from period averages of the annual gain, main sample unless stated. Share of 2023 GDP (HUF 75,218 billion), applied to the 2023 value added of the firms kept under each rule or of all market-economy firms with 5+ employees (HUF 29,979 billion). Trim: percentage at each tail of both deviations. $\sigma = 5$ and the capital-cost variant use the 1% trim; only the all-firm base is shown for them.

Limitations. The level of the efficiency gap depends on the model (CES demand with a common σ , Cobb–Douglas technology with industry factor shares), on two-digit industries and on trimming. Hungarian factor shares may themselves contain distortions. Capital is measured at book value. The benchmark does not identify which policies created the wedges, or what a particular reform would deliver. The GDP share compares a value-added change for market-economy firms with 5+ employees to total GDP, so it ignores the rest of the economy. For these reasons the main text reports a magnitude, a one-off rise in the level of output of 1–2% of GDP (0.2–0.4 percentage points of growth a year if reached over five years), not a point estimate.

**Figure 9:** Exercise 3: efficiency gap by sector

Notes: Value-added-weighted average across the two-digit industries of each sector of $\ln(TFP^{\text{eff}}/TFP)$, in log points, main sample, period averages. Sector shares in value added in 2016–2023 in brackets.

Sector decomposition and dispersion. $\ln(Y^{\text{eff}}/Y) = \sum_s \theta_s \ln(TFP_s^{\text{eff}}/TFP_s)$ is additive across industries, grouped into eleven sectors. Between 2004–2010 and 2016–2023 the aggregate rises from 41.9 to 47.9 log points: +6.4 from larger gaps within sectors at initial shares and –0.4 from changes in shares (with symmetric weights at the two-digit level +6.8 and –0.8). Standard deviation of logs within industry-years, period averages: $TFPR$ 0.51, 0.52, 0.52; return on capital 1.45, 1.58, 1.57; return on labour 0.55, 0.53, 0.53 (2004–10, 2010–16, 2016–23). The

return-on-capital dispersion rose early and then stayed high while the efficiency gap kept rising, so its rise also reflects how wedges line up with firm productivity, not only their spread.

Poland. [Gradzewicz \(2026\)](#) applies the method to Polish firms with 10+ employees and finds the efficiency gap rising from close to 40% in the 1990s to 70–75% in the early 2020s; samples and assumptions differ from ours.

H Replication and checks

The results come from three make-based pipelines (Stata 18 and Python 3) in folders `tfp/misallocation`, `tfp/reallocation` and `tfp/hsieh-klenow`, each with a README, a decision log and aggregated outputs. All tables are built from output files by one script; numbers quoted in the prose were checked against those files but are typed. The dispersion series and the Hsieh–Klenow efficiency gaps were re-implemented independently in Python (within 0.0003 and to machine precision). Two independent reviews of earlier versions and the responses to them are filed with the code. Firm-level data are licensed and stay in the research environment; only aggregates are published.

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