

RESEARCH REPORT

Explaining productivity differences across the Atlantic

This report separates sector composition, capital intensity, and working time in transatlantic productivity comparisons. Official evidence and a reproducible decomposition show why differences within industries require closer examination before aggregate gaps support policy conclusions.

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Differences in output per hour between the United States and Europe are economically consequential, but the headline comparison leaves several questions unresolved. A higher level can reflect more capital, different industries, differences within the same industry, or the way output and working time are measured. Faster growth over a particular interval can reflect recovery from a disruption rather than a lasting change in the economy's productive capacity. These explanations imply different responses by firms and policymakers.

This report separates those questions. It examines evidence for the United States, the euro area, Germany, and France; distinguishes a productivity level from its growth rate; and supplies a transparent decomposition of sector productivity and employment structure. The numerical decomposition is an original hypothetical example, not a new estimate of the transatlantic gap. Its purpose is to show precisely what an empirical explanation must establish before a policy conclusion follows.

The central finding is a qualified one. Sector composition matters to aggregate comparisons, but it cannot be presumed to explain the observed growth divergence. Official research points toward substantial differences within industries. Those differences still require explanation: investment, utilization, skills, organizational practices, energy exposure, and statistical treatment can all affect measured output per hour. A residual labeled productivity is not, by itself, a measure of technology or management quality.

What the observed evidence establishes

The OECD's 2026 compendium reports total-economy GDP per hour growth in 2024 of 2.2 percent in the United States, minus 0.4 percent in Germany, and 0.4 percent in France. These are annual growth rates, not levels or estimates of worker effort. The same publication reports 0.2 percent for the European Union; that aggregate must not be relabeled as the euro area. The observations describe 2024 in the publication's statistical vintage, rather than the latest quarterly position in October 2026. [OECD, productivity developments in 2024](#).

A Bank of Italy study published in April 2025 examines the United States and euro area over the post-pandemic period, including 2019-23 sector decompositions. It finds a limited role for movement between broad sectors and a substantial role for developments within them, especially information and communication activities. The authors also acknowledge differences in industry coverage. Their results are evidence about that period and specification, not a general proof that every employment reallocation policy is ineffective. [Bank of Italy, Occasional Paper 924](#).

These two pieces of evidence concern different periods and statistical exercises. They are mutually informative without being interchangeable. The OECD annual country observations establish that Germany and France did not share an identical growth outcome. The research decomposition supplies a reason to look inside industries rather than attribute the whole transatlantic difference to the share of manufacturing or technology in each economy. Neither source alone identifies the causal return to a particular reform.

A comparison should therefore begin with a statement of the outcome to be explained. Is it the level of GDP per hour in a benchmark year, its average growth since 2019, or a change in one quarter? A country can have a relatively high level and weak recent growth. It can also recover rapidly from a depressed starting point while remaining below another country's level. Combining these cases under a single description of competitive strength conceals the relevant economic problem.

Establishing a comparable denominator

Output per hour is a ratio. Both the output boundary and the hours boundary must agree. Whole-economy GDP includes activities whose output is difficult to price, including many public services. A business-sector productivity measure removes parts of that economy. A private nonfarm measure removes further activities. A comparison of American business productivity with European whole-economy productivity can be useful for separate domestic purposes, but it does not hold the production boundary constant.

Working time introduces another distinction. Hours per employee, hours per employed person, and total hours worked are not equivalent where self-employment and multiple jobholding differ. Paid hours can include time away from production. Headcount may increase while average hours fall. For an international comparison, the denominator should identify actual hours and the treatment of self-employed workers, rather than assume that a familiar labor-market series has the required national-accounts coverage.

Eurostat's annual national accounts metadata identifies separate units for persons, hours, and jobs and explains the ESA 2010 framework. It also distinguishes the compilation of European aggregates from a simple sum of national chain-linked series. These are substantive features of the comparison. Using a common currency does not by itself harmonize the volume measure or the labor input. [Eurostat, annual national accounts metadata, updated January 7, 2025](#).

Hours measurement can affect both the level and the growth rate of productivity. If output is unchanged and measured hours are revised downward, output per hour rises mechanically. That revision may improve accuracy without representing any change in a factory, office, or service establishment. An empirical report

should preserve the data vintage used for output and hours and investigate whether a change in sources coincides with an apparent break in productivity.

Geographical coverage also needs a fixed definition. Germany and France are members of the euro area, but neither is a proxy for it. An aggregate contains countries with different production structures, employment developments, and multinational activity. Changes in membership can alter a time series unless the historical area is held constant. A cross-country explanation should state whether it studies a fixed group over time or the membership prevailing in each year.

Levels, growth, and purchasing power

International productivity levels require a conversion of output values into comparable purchasing power. Market exchange rates are useful for financial transactions and the foreign-currency cost of an acquisition. They also fluctuate for reasons that do not represent an immediate change in domestic production efficiency. Converting national output at those rates can cause the measured productivity ranking to move while the underlying physical processes remain much the same.

Purchasing power parities address a different question: the relative price of comparable goods and services. The OECD's 2026 discussion of productivity levels explains that comparisons depend on the price basis and PPP treatment. A level comparison at current purchasing power and a time series expressed in constant benchmark-year purchasing power serve different analytical purposes. The choice should be disclosed alongside the result, rather than confined to an inaccessible technical appendix. [OECD, labor productivity levels and growth](#).

Economy-wide PPPs also do not automatically provide a suitable conversion for each industry. A productivity comparison of manufacturing equipment, retail distribution, and legal services requires prices that reflect those activities. Applying a single economy-wide conversion to every industry may leave relative price differences inside the estimated sector gaps. Such calculations can be informative, but their interpretation should remain conditional on the conversion assumption.

Growth comparisons reduce some level-conversion problems because each economy's output change is measured in its own volume system. They do not remove differences in deflation, quality adjustment, and industry classification. Software, digital services, pharmaceuticals, and other products with changing characteristics are particularly sensitive to the distinction between a higher price and a better product. A gap in measured volume growth should prompt inspection of these treatments before it is assigned entirely to production technology.

The relevant comparison for a business decision may be narrower still. A company choosing where to supply a customer needs delivered cost, reliability, skills, market access, and required capital alongside productivity. Higher output per hour can coexist with higher wages and a lower or higher unit labor cost. Economy-wide productivity is valuable context, but it is not a substitute for the economics of a particular production process.

A reproducible separation of sector effects

The following example holds prices, industry definitions, and hours coverage constant by construction. It contains two hypothetical economies, X and Y, and two industries. The productivity numbers are units of real value added per hour. The hours shares sum to one within each economy. They are chosen for illustration and do not represent the United States, Germany, France, or the euro area.

Hypothetical industry	Productivity in X	Productivity in Y	Share of hours in X	Share of hours in Y
A	100	90	0.40	0.20
B	50	45	0.60	0.80
Aggregate	70	54	1.00	1.00

Aggregate productivity is the hours-weighted average: P equals the sum across industries of s multiplied by p . X therefore has productivity of $0.40 \times 100 + 0.60 \times 50 = 70$. Y has $0.20 \times 90 + 0.80 \times 45 = 54$. The level gap is 16 units per hour, or 29.63 percent of Y's level. That percentage is a relative level difference, not a growth rate.

A symmetric decomposition assigns the gap to two terms. The within-industry term is the difference in each industry's productivity multiplied by its average hours share across the two economies. The composition term is the difference in hours shares multiplied by the average productivity of that industry. Using averages treats both economies symmetrically and allocates the interaction between productivity and structure without choosing one economy as the sole reference.

Component of the illustrative gap	Calculation	Units per hour
Within industry A	$0.30 \times (100 - 90)$	3.0
Within industry B	$0.70 \times (50 - 45)$	3.5
Composition in A	$95 \times (0.40 - 0.20)$	19.0
Composition in B	$47.5 \times (0.60 - 0.80)$	-9.5
Total	$3.0 + 3.5 + 19.0 - 9.5$	16.0

The decomposition is exact for these additive data. Within-industry differences account for 6.5 units, while composition accounts for 9.5. Neither figure is a causal estimate. A high-productivity industry's share may be greater because of comparative advantage, market demand, past investment, or a classification decision.

Moving an additional worker into that industry would not necessarily produce the average productivity already observed there.

A different counterfactual illustrates the reference problem. Applying X's hours shares to Y's industry productivity gives $0.40 \times 90 + 0.60 \times 45 = 63$. On that reference basis, changing Y's structure raises its aggregate from 54 to 63, leaving seven units between that counterfactual and X. Those nine and seven units differ from the symmetric decomposition's 9.5 and 6.5 because the interaction is allocated differently. The total gap remains 16.

Actual national accounts require additional care. Chain-linked volume measures need not be additive across industries, and industry PPPs may be incomplete. The OECD notes a Fisher-index residual for the United States in its growth decomposition and differences in the available industry detail, including broader A21 data for Germany and France than for many other countries. The simple exact identity above must not be presented as an exact decomposition of those official series without the necessary methodological adjustment. [OECD, Figure 1.3 methodological note](#).

What can lie inside an industry difference

An industry is an administrative grouping, not a single production technique. Its measured productivity can change because existing establishments improve, efficient firms expand, weaker firms exit, or the mix of products changes. A within-industry contribution at a broad level can therefore contain substantial reallocation between firms and narrower activities. A small between-industry contribution does not establish that allocation is unimportant throughout the economy.

This distinction matters for Germany and France. Treating manufacturing as one category can combine industries with very different energy requirements, export markets, and capital needs. Treating services as one category can combine scalable software production with activities that depend on personal time at a particular location. An explanation based on a broad manufacturing share may therefore miss the production relationships that determine the measured result.

Capital intensity supplies one such relationship. A worker operating modern equipment or using reliable software can produce more in an hour without a change in personal effort. The relevant input is the service provided by capital, not simply the historical purchase price of assets. Assets with different depreciation, utilization, and economic lives provide different services. Comparing nominal investment shares alone does not establish how much productive capital is available per hour worked.

Investment also has a timing dimension. A building or data center can be recorded as investment before it supplies its full services. Training, installation, and organizational change can absorb working time before output responds. Later, the same capital can support higher output with little new expenditure. A short interval of high investment and weak productivity can therefore reflect an implementation period, though that possibility cannot be used to excuse a permanently unproductive project.

An informative empirical test would connect the asset to its users. For computing, that means separating producers of digital equipment from firms adopting it. For manufacturing, it means examining whether new

machinery is installed, connected to suppliers, and used at an economically viable capacity. For public infrastructure, it means determining whether the service constraint facing private production has actually eased. The existence of an expenditure line is only the start of that inquiry.

Multifactor productivity is useful when labor and capital inputs are measured consistently. It is also a residual, affected by omitted inputs, utilization, measurement error, and the assumed production relationship. If energy disruption leaves equipment idle while the workforce is retained, measured productivity can fall without the underlying equipment or employee skills deteriorating. A recovery in utilization can subsequently raise productivity without a new technological discovery.

The Bank of Italy paper discusses energy costs, capital intensity, and information technology among explanations of the post-pandemic divergence. Those are competing and interacting mechanisms. Its analysis should not be reduced to a single claim that technology alone explains the entire difference. Establishing causation would require evidence connecting exposure, investment, and output while addressing demand and other simultaneous shocks. [Bank of Italy, sections 1-3.](#)

Hours, employment, and living standards

Output per hour is one component of output per resident. An exact accounting relationship is $\text{GDP per person} = \text{GDP per hour} \times \text{hours per employed person} \times \text{employed persons per resident}$, provided the coverage of output and employment is consistent. This identity separates productive efficiency from the amount of paid work carried out across the population. It does not rank social preferences or measure all aspects of living standards.

Consider another explicitly hypothetical comparison. Economy X produces 100 units per hour, works 1,800 hours per employed person annually, and employs half its residents. Its output per resident is 90,000 units. Economy Y produces 80 units per hour, works 1,600 hours, and also employs half its residents. Its output per resident is 64,000. The ratio is 64,000 divided by 90,000, or 71.11 percent: the product of an 80 percent hourly-productivity ratio and an 88.89 percent hours ratio.

It would be incorrect to call the whole 28.89 percent difference a productivity gap. Part reflects fewer annual working hours. It would also be incorrect to assume that all fewer hours reflect voluntary leisure. Part-time work, unemployment, health, care responsibilities, institutional arrangements, and job availability can influence the result. The accounting identifies where the difference appears; further evidence is needed to explain why it appears there.

The selection of workers can change measured average productivity. If workers in relatively low-productivity jobs leave employment, average output per hour can rise even while aggregate output and household incomes fall. Conversely, successful entry into employment can lower the average if entrants initially produce less than established workers. Evaluating participation policy exclusively through the average productivity ratio could therefore penalize an economically and socially valuable expansion in employment.

For France and Germany, the distinction between hours and employment is particularly relevant to interpreting changes in work patterns. A reduction in average hours with broadly stable employment need not have the

same consequences as a reduction in employment with unchanged hours among those remaining. Business demand for labor, the financing of social insurance, and household disposable income can move differently in those cases. They require separate observation rather than an inference from a single productivity series.

Drawing policy conclusions at the appropriate scale

A diagnosis centered on industry composition would emphasize conditions for entry, expansion, and the movement of resources. A diagnosis centered on weak performance within industries would give greater attention to diffusion, management, skills, investment, and competitive pressure among existing firms. In practice, the distinction is incomplete because better firms need the ability to expand and new technologies require workers and capital to move within industries.

The empirical sequence matters. First identify the industries accounting for a material share of the observed gap. Then separate changes in their output from changes in their hours. Examine capital services, utilization, and product composition before assigning the remainder to organizational efficiency. Finally ask whether the proposed intervention addresses the constraint identified. A general investment subsidy is not automatically the appropriate response to a shortage of skilled installers or delays in electricity connections.

The same discipline applies to finance. A firm may have a productive project but lack suitable long-term funding. Another may have access to cheap capital but no profitable demand for additional output. Raising investment spending in both firms does not guarantee the same productivity response. Evidence on financing constraints should distinguish the inability to fund an otherwise viable investment from a decision not to invest because expected returns are weak.

International comparisons can clarify those mechanisms without implying that an institution can be transplanted unchanged. Employment protection, training systems, bankruptcy processes, market size, procurement, and household saving interact. A reform that improves one measured margin can create costs elsewhere. The relevant assessment is the expected net effect over a stated horizon, including implementation costs and the distribution of gains, rather than resemblance to the country with the strongest headline number.

For corporate leadership, the practical application is a comparison of matched activities. A transatlantic group can examine the same product, customer requirement, capital vintage, and quality standard across locations. It should include central services and outsourced inputs consistently. Output per employee measured at a subsidiary can rise when work is outsourced, even if group-wide resource use is unchanged. A matched comparison is more useful for operational decisions than an unadjusted ranking of national averages.

There are also limits to what this report establishes. It does not estimate a new percentage attribution of the observed transatlantic gap, combine incompatible industry volume series, or identify a causal return to a specific reform. Its official evidence supports attention to within-industry developments; its original examples establish the accounting and reference choices required for a further empirical estimate. Keeping that boundary explicit permits a stronger, narrower conclusion than assigning unexplained differences to a broad national characteristic.

Sensitivity to the analytical design

The industry detail should be tested rather than chosen once. Repeating a decomposition at a broad and a narrower classification can show whether a finding of limited reallocation survives greater detail. If the measured between-industry contribution increases materially at the narrower level, the earlier within-industry result partly reflected aggregation. That does not invalidate the broad calculation; it changes what its categories mean. Coverage should be held constant across the two exercises so that the test isolates classification rather than the addition of previously missing activity.

The period should receive a similar test. Starting in a disruption year can give exceptional weight to closures and subsequent reopening. Starting immediately before that disruption may better capture the whole adjustment, while a longer pre-period helps establish whether an apparent break is new. Reporting both cumulative and annualized changes prevents a small difference in the length of the interval from being mistaken for a large difference in performance. Revision sensitivity should be recorded separately from sensitivity to the start date.

Finally, a comparison of Germany and France should be shown before combining them with other euro-area members. An aggregate can change because of developments in its largest economies, movements elsewhere, or changing weights. National differences can also offset one another. The explanation should therefore be able to reconcile its country results with the area result, including the price and aggregation method, before claiming that a single mechanism describes the whole monetary union.

A matched-firm interpretation of the sector result

The sector decomposition identifies where an aggregate gap appears, but a matched-firm comparison can test what happens inside the category. An international group should compare plants or teams supplying similar products with a consistent treatment of central engineering, software, and purchased services. If one location carries headquarters functions while another purchases them internally, their unadjusted value added per hour can differ even where production efficiency is similar. Transfer prices add another reason to avoid treating subsidiary accounts as direct national productivity estimates.

A useful comparison would record capital age, downtime, defect rates, utilization, and delivery requirements alongside hours. Higher output per hour obtained by running equipment more intensively can have different maintenance and replacement implications from a technical improvement. A plant with spare capacity may look less productive during weak demand but remain valuable for reliability or future expansion. These observations explain why a productivity ranking alone is not an investment recommendation.

At the policy level, such evidence can help identify whether a constraint is common to an industry or specific to a firm. Repeated delays in a network connection point to a different intervention from weak maintenance practice in one establishment. The aggregate finding supplies a place to investigate; matched operational evidence supplies a more concrete account of the mechanism. Neither should be substituted for the other.

Conclusion

An adequate explanation of transatlantic productivity differences needs a consistent production boundary, hours measure, price basis, and period. It then needs to distinguish the productivity of activities from the allocation of hours among them. The available official evidence gives substantial weight to developments within industries, while also showing why Germany, France, the euro area, and the European Union cannot be treated as interchangeable observations.

Capital intensity and hours help explain measured outcomes, but neither resolves the whole question. Productive adoption, utilization, firm dynamics, and statistical treatment remain central. For policy and business decisions, the most useful next step is to identify a concrete constraint in a comparable activity and test whether the proposed response can change it. That is a more demanding standard than a headline productivity ranking, and a more useful basis for action.

For the American expenditure and production accounts, see [The composition of American economic growth](#). For a specific European industrial constraint, see [Infrastructure bottlenecks and German capital formation](#).

Source addresses

The links below retain the source addresses cited in the analysis. References should be read within their stated periods and scope.

https://www.oecd.org/en/publications/oecd-compendium-of-productivity-indicators-2026_734a5e68-en/full-report/productivity-growth-in-a-challenging-global-environment_d888e417.html

https://www.bancaditalia.it/pubblicazioni/qef/2025-0924/QEF_924_25.pdf

https://ec.europa.eu/eurostat/cache/metadata/en/nama10_esms.htm

https://www.oecd.org/en/publications/oecd-compendium-of-productivity-indicators-2026_734a5e68-en/full-report/labour-productivity-in-oecd-economies-recent-trends-and-shifting-drivers-of-growth_cd896487.html