
Facing Up to Low Productivity Growth: Introduction

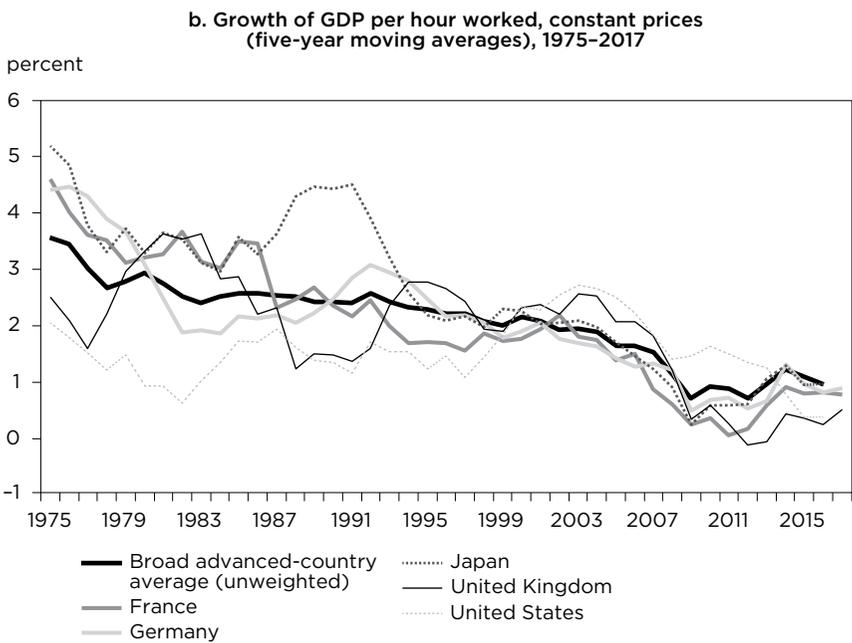
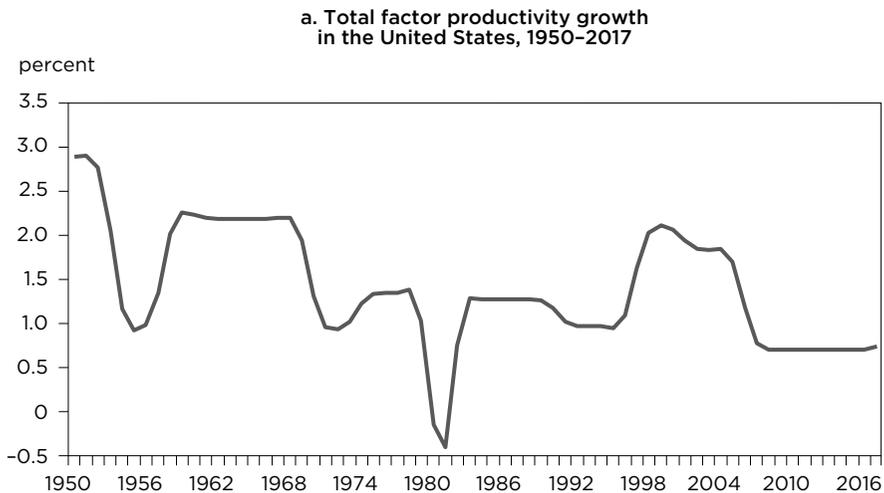
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Since the mid-2000s, virtually all economies in the Organization for Economic Cooperation and Development (OECD) have experienced a decline in average productivity growth, compared with both the preceding decade and long-term postwar averages (OECD 2015). In the United States, the decline began after the end of a temporary boom in total factor productivity (TFP) growth that began in the mid-1990s (figure I.1). In most other major economies, it reflected a continuation of a trend that started in the early 1970s.

The reduction in recorded productivity growth does not mainly appear to reflect poor measurement. GDP and, by extension, productivity are indeed mismeasured—because quality improvements or intangible investment in training, reorganization, and advertising are not adequately counted, for example. But mismeasurement cannot explain the productivity slowdown in the United States, because it was even worse between 1996 and 2004, when productivity boomed (Byrne, Fernald, and Reinsdorf 2016). Free digital services—online searches, social networks, and entertainment—have been on the rise since the mid-2000s, but including them as part of household final consumption has only a small impact on growth (Nakamura and Soloveichik 2015; Byrne, Fernald, and Reinsdorf 2016). Furthermore, the productivity slowdown across countries does not appear to be correlated with cross-country differences in the production or use of information tech-

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Figure I.1 Productivity growth in the United States and other advanced economies



Sources: Data in panel A are from CBO (2018, supplemental table 1); data in panel B are from OECD.Stat.

nology (IT), suggesting that mismeasurement of IT services cannot be the reason for the slowdown (Syverson 2017). Although the data are imperfect, the phenomenon of lower productivity hence needs to be taken seriously.

A substantial body of literature explores the possible causes of the productivity slowdown. The most influential explanations focus on technology. Gordon (2012) conjectures that the slowing of growth across the industrial world since the 1970s mainly reflects the absorption of the main inventions of the late 19th century—electricity, the telephone, and the internal combustion engine. Fernald (2014) provides evidence that the US slowdown since 2004 was the “flip-side of the mid-1990s speed-up” linked to IT. Additional explanations include educational plateauing (no further rises in years of schooling); expansion in global labor supply as China and Eastern Europe were integrated into the global economy in the 1990s and early 2000s; end of a temporary productivity boom related to outsourcing and creation of global value chains; and decline in new business creation, business dynamism, and technology diffusion (Fernald and Jones 2014; Gordon 2010, 2014; Goodhart and Pradhan 2017; OECD 2015; Andrews, Criscuolo, and Gal 2016; Decker et al. 2017).

In contrast, very little work has been done on the consequences of the slowdown, in part because the first-order impact (lower growth and lower standards of living) seems obvious. There is also a view that the productivity slowdown will not persist. The Congressional Budget Office (CBO) projects a rise in TFP growth from about 0.7 percent a year (its level since 2008) to a long-run rate of 1.2 percent (its average level during 1972–2017). “Techno-optimists” predict a return to TFP growth closer to 2 percent, in line with the experience in 1950–1972 and 1996–2004, arguing that recent and future digital innovations will eventually accelerate productivity growth (Brynjolfsson and McAfee 2014; Mokyr 2014; Mokyr, Vickers, and Ziebarth 2015; Branstetter and Sichel 2017).

The premise of this volume is that it is important to explore the economic and social consequences of a sustained period of slower productivity growth in advanced economies, for two reasons. First, one does not have to be a techno-pessimist to believe that slower productivity growth may persist for some time. Even if the digital revolution does, at some point, translate into higher productivity growth, that point may be some way off. In the meantime, various headwinds are likely to hold back productivity growth.¹ Some, such as the educational plateau in advanced economies

1. Studies that speak to one or several of these arguments include Jorgenson and Vu (2010), Gordon (2012, 2014), German Council of Economic Experts (2015), Fernald and Jones (2014), and Summers (2014).

and a leveling off in trade integration, are to blame for the slowing that has already occurred. And following the decision of the United Kingdom to leave the European Union and the election of a protectionist president in the United States, there is concern that trade integration and cross-border value chains, which have been a source of productivity gains in the past, could be reversed rather than just level off.

Second, the first-order effect of slower productivity growth—lower than expected future living standards—masks more granular consequences that could have significant welfare implications for specific countries, sectors, and population groups and could both influence and be influenced by public policy. Slowing productivity does not mean that productivity slows everywhere in tandem. As a result, it could lead to either a widening (e.g., between firms) or a narrowing (e.g., between some countries) of productivity gaps, with potential consequences for inequality, capital flows, and politics. For related reasons, the slowdown may not affect government revenues and expenditures one for one and hence have fiscal implications. To the extent that lower productivity prolongs the current period of very low interest rates, it could also have implications for financial stability.

The contributions in this book explore some of these more granular consequences. The common assumption is that productivity growth remains at the low average level of the past decade, about 0.5 percent a year lower than currently expected by forecasters such as the CBO. The chapters analyze the implications of this sustained drop for fiscal sustainability, including the sustainability of pension systems and tax policy; wages and income distribution; international trade; and growth in emerging-market economies.

Fiscal Implications

The first five chapters focus on fiscal implications. Neil Mehrotra (chapter 1) focuses on the impact of slower productivity growth on the ability of countries to pay off their public debts, analyzing both the relevant macroeconomic mechanisms and the international evidence. Elena Duggar (chapter 2) takes a broad view of the potential impacts on sovereign risk through several channels, including quasi-fiscal liabilities and financial stability. Karen Dynan (chapter 3) asks whether adapting to lower productivity growth requires changes in tax policy. Louise Sheiner (chapter 4) looks at the impact on revenues and expenditures at all three levels of government (federal, state, and local) in the United States. Axel Börsch-Supan (chapter 5) explores the effects of lower productivity growth on pension systems around the world.

As Mehrotra explains, the impact of lower productivity growth on debt sustainability—defined as a stable or declining ratio of public debt to GDP—is *prima facie* ambiguous. For a fixed primary (noninterest) deficit, debt sustainability depends on the real interest rate (r), which affects the numerator of the debt-to-GDP ratio, and real growth (g), which affects the denominator. Lower than expected productivity growth will lower g , but according to most macroeconomic models—and the broad data trends documented in chapter 1—it would also be expected to translate into lower real interest rates. Depending on the strength of the relationship, debt sustainability may deteriorate, stay about the same (if r and g decline by the same amount), or even improve. Small open economies, whose interest rates are determined by world interest rates rather than domestic growth, may even benefit from a productivity slowdown in the United States and other large advanced economies, because it would tend to lower their borrowing costs and they might be able to buck the trend toward lower productivity growth.

This relatively sanguine assessment could change if productivity growth affects not only r and g but also the noninterest deficit. Sheiner concludes in chapter 4 that slower productivity growth is likely to lead to a deterioration of the US fiscal balance, particularly at the federal level, by (1) reducing real bracket creep (the tendency for productivity growth to raise tax rates by shifting up real income); (2) gradually raising inflation-indexed expenditures, such as social security benefits and certain discretionary outlays as a share of GDP; and (3) increasing poverty and hence poverty-related social spending.

The impact of these effects is small in any given year but adds up over time. According to Sheiner, a 0.6 percentage point reduction in annual productivity growth compared with the CBO's baseline would raise the projected federal primary deficit in 2042 from 3.2 to 5.1 percent and the projected federal debt level from 130 to 159 percent of GDP. The projection for the federal debt assumes that lower productivity growth would lead to a correspondingly lower rise in the interest rate path compared with current projections. If it does not—that is, if the CBO's baseline interest rate assumptions are maintained—the 2042 debt-to-GDP ratio could rise by more than 40 percentage points, to 173 percent of GDP. If the interest rate path reacts to the lower productivity baseline by more than one-for-one, the debt-to-GDP ratio would rise by less compared with the baseline, but for plausible parameter ranges it would still rise. Assuming a two-for-one reaction of interest rates to the reduction in productivity growth, for example, Sheiner projects a rise in the 2042 debt-to-GDP ratio to 146 percent, 16 points above the latest CBO baseline projection.

One of the drivers of the deterioration of US fiscal accounts that would accompany lower productivity is an increase in spending on social

security (pensions). Could lower productivity growth also put pressure on other pension systems, particularly in Europe? As Axel Börsch-Supan shows in chapter 5, the answer depends on the system, but the results are generally less alarming than one might expect. The reason is that while US social security benefits are linked to the price level, pension benefits in most other pay-as-you-go systems are indexed to current wages.² In such systems, slower productivity growth will induce slower growth in both wages and pensions—and hence keep benefits stable relative to the contributions of the current working-age generation.

In contrast, fully funded systems adjust benefits in line with either accumulated savings (in defined-contribution systems) or preretirement wages (in defined-benefit systems). In both cases, a decline in productivity growth leads to reduced benefits, via lower interest rates or lower wages. The reduction is bad for the retiree, but the solvency of the system generally remains unaffected. The only exception would be a situation in which interest rates react more sharply to a drop in productivity growth than wages, reducing the assets of a fully funded system relative to its liabilities.

To summarize the flavor of these contributions, slower productivity growth will have a negative impact on the fiscal position of the US federal government and on some pension systems. These impacts need to be understood and addressed, but they appear manageable. In particular, Sheiner's analysis implies that a cumulative fiscal adjustment of just 1 percent of GDP over the next 25 years would be enough to offset the deterioration of the primary fiscal balance caused by slower productivity growth. This adjustment is much smaller than the fiscal adjustment needed to offset the adverse fiscal effects of population aging or the effects of President Trump's recent tax cuts.

This relatively reassuring conclusion is likely to understate the threat that slower productivity growth presents to fiscal stability—and economic stability more broadly—for at least two reasons, however. First, persistent low productivity tends to go along with persistent low interest rates and flat yield curves. It creates financial sector risks by encouraging overborrowing by corporations and households, by making it harder for banks and life insurance companies to make profits, and by encouraging riskier or leveraged investments (IMF 2016a). As Duggar points out in chapter 2, financial sector crises have historically represented the biggest single risk to

2. Pension benefits and current average wage levels are linked both in flat-benefit (Beveridgean) pay-as-you-go systems, in which the level of benefits does not depend on individual lifetime contributions, and in earnings-related (Bismarckian) systems. In Bismarckian systems, lifetime earnings determine the level of benefits relative to current average wages, not their absolute level.

sovereign balance sheets. Through this channel, slower productivity growth could create fiscal problems even when its direct fiscal sustainability implications are modest.

Second, both Sheiner and Börsch-Supan explicitly or implicitly assume that low productivity growth translates into low wage growth but does not affect the distribution of wages. Suppose, however, that wages become more dispersed as productivity and average wages grow more slowly (a well-founded concern, as shown below). According to Sheiner, greater dispersion would magnify the impact of lower productivity growth on social spending and hence on the primary fiscal balance. It could also translate into negative real pension growth at the bottom of the earnings distribution. Such an erosion of benefits may not be feasible socially or politically, particularly in systems in which replacement rates are already declining because of population aging, creating pressures to subsidize the system.

The discussion so far carries several policy implications. A “low-for-long” environment calls for regulatory and supervisory policies, including macroprudential policies, that identify and contain emerging financial sector risks. It also requires policies that create fiscal space to accommodate and offset inevitable spending pressures. These policies could focus on the efficiency of spending, on the revenue side, or both.

Beyond the need to create or preserve fiscal space, sustained low productivity growth may have implications for tax policy. In chapter 3, Dynan points to three. First, in a low growth, low interest rate environment, monetary policy will find it harder to stabilize economic fluctuations. This calls for strengthening tax-based automatic stabilizers. Second, lower wage growth may weaken incentives for work participation, which could further reduce per capita income growth. This argues for improved tax incentives for work. Finally, slower income growth may suggest raising savings, including through higher tax subsidies for individual retirement savings, particularly to encourage well-designed workplace retirement savings plans.

International Dimensions

Two chapters look at the implications of slowing productivity growth for emerging-market economies and international trade. In chapter 6, José De Gregorio asks how slowing productivity growth in advanced economies might affect emerging-market economies. The results are not encouraging. Although the GDP per capita gap has narrowed between emerging-market economies and the United States, it is explained by faster accumulation of physical and human capital. In contrast, TFP growth in most emerging-market economies has been slower than in the United States. This is bad news, because it is difficult to imagine sustained catchup in living stan-

dards without an acceleration of TFP: As De Gregorio shows, TFP growth rather than factor accumulation tends to drive growth accelerations in emerging-market economies. He also shows that productivity growth in emerging-market economies is correlated with that of advanced economies and that this correlation has increased in recent years, perhaps as a result of increased trade-related spillovers. Hence a slowdown in productivity growth in advanced economies could make an already bleak picture in emerging markets even bleaker.

In chapter 7, Filippo di Mauro, Bernardo Mottironi, Gianmarco Ottaviano, and Alessandro Zona-Mattioli examine the implications of a sustained slowdown in productivity growth for exports. Using a large firm-level database, they show that an economy's export performance depends on its share of highly productive firms—that is, it is not just average productivity that matters, but the size of the right tail of the productivity distribution of firms. They also show that export competitiveness of countries depends not only on average TFP growth—which both shifts the productivity distribution of firms and increases its dispersion—but also on an economy's allocative efficiency, which measures the extent to which employment is located in the most productive firms. Their main conclusion is that a sustained slowdown in TFP growth by about 0.4 percentage point relative to the baseline would reduce the annual increase in export competitiveness from 0.5 to 0.3 percent. Di Mauro et al. also show that an improvement in allocative efficiency can go some way toward offsetting this effect. For example, a reform that moves a country from the average allocative efficiency case to the top 10 percent could offset the impact of slowing productivity growth on export competitiveness for as long as three and a half years.

Wages and Inequality

One premise underlying virtually all thinking about the consequences of lower productivity growth is that lower growth in labor productivity implies lower real wage growth. Consequently, efforts to reverse productivity growth are often motivated by the need to restore growth in average or median wages. But as an empirical matter, is there a link? Raw data suggest that the link may be broken. Since 1973, US median compensation grew by only 11 percent in real terms, while labor productivity rose 75 percent.

However, as Lawrence Summers and Anna Stansbury show in chapter 8, productivity continues to exert a strong influence on wages. All else equal, a 1 percentage point increase in productivity growth has been associated with 0.65 to 1.0 percentage point higher median real compensation growth since 1973. Hence the divergence between wage and productivity

trends observed since then does not reflect a weakening of the relationship between productivity growth and wage growth but rather third factors that have partly offset the impact of higher productivity on wages, lowering the labor share of GDP.

What could these factors be? One possibility is technological progress, in the form of capital-augmenting technological change that leads to the automation of production. Another could be related to the increasing concentration and market power of firms. As Furman and Orszag argue in chapter 9, this hypothesis could potentially explain not just the decline in the labor share—why wages have fallen relative to profits—but also observed increases in earnings inequality, as the incomes of top earners have continued to rise while those of most Americans have stagnated. It could also be contributing to the productivity slowdown. In other words, it is possible—indeed, plausible, according to the evidence presented by Furman and Orszag—that the increase in inequality and the slowdown in productivity growth observed since the early 2000s have a common cause—namely, a reduction in competition and firm dynamism, reflecting both “natural” trends, like the increased importance of network externalities in the internet economy, and increased regulatory barriers to entry.

The increase in the concentration and dispersion of firm-level profitability lowered innovation and investment and led to rising inequality, of two varieties: (1) lower wages and higher profits, as a result of increased employer leverage and reduced worker mobility and (2) increasingly disparate wages, as increasingly disparate firm-level success is passed on to firms’ employees. If Furman and Orszag are correct, a scenario of sustained low productivity growth in the future would be expected to go along with continued high—and possibly increasing—earnings inequality.

Policy Implications

One useful way of thinking about the policy implications of the analysis is to transpose the distinction between mitigation and adaptation familiar from the climate change literature. Policies that are mainly adaptive—in the sense that they seek to minimize the economic and social costs of the productivity slowdown—include defending or freeing up fiscal space, strengthening automatic stabilizers, preventing financial crises, and rebalancing tax incentives in a way that encourages labor force participation. Other policies in this category include strengthening the redistributive capacity of the tax and transfer system, to reduce the extent to which a widening dispersion of market earnings increases inequality of disposable incomes.

If, however, slower productivity growth and higher inequality have common causes, as Furman and Orszag argue, policies should not stop

here but rather attempt to address these causes directly. Policies of this type could both mitigate and help countries adapt to the productivity slowdown. Based on the chapters by Furman and Orszag, Di Mauro et al., and De Gregorio, these policies include the following:

- Enhancing entry and competition among firms (through, for example, vigorous enforcement of antitrust policies, limits on the scope of intellectual property protections, and efforts to reduce regulation that creates barriers to entry) would both benefit innovation and investment and reduce rents, which increase inequality.
- Facilitating the mobility of workers (by, for example, reducing occupational licensing and land use restrictions) would enhance allocative efficiency (and hence aggregate productivity) and strengthen the bargaining power of workers.
- Strengthening education and universal healthcare would increase labor productivity and allocative efficiency by making it easier for workers to move across firms.
- Reducing tariff and nontariff trade barriers would help offset the adverse impact of the productivity slowdown and mitigate the productivity slowdown itself, as the decline in trade since the Great Recession—which reflects increasing “micro protectionism” (Hufbauer and Jung 2016, IMF 2016b)—contributes to slower productivity growth.

Depressingly, many governments—not least in the United States—have recently been implementing policies that seem to head in the opposite direction.

References

- Andrews, D., C. Criscuolo, and P.N. Gal. 2016. *The Best versus the Rest: The Global Productivity Slowdown, Divergence across Firms and the Role of Public Policy*. OECD Productivity Working Paper 05. Paris: Organization for Economic Cooperation and Development.
- Branstetter, L., and D. Sichel. 2017. *The Case for an American Productivity Revival*. PIIIE Policy Brief 17-26. Washington: Peterson Institute for International Economics.
- Byrne, D. M., J. G. Fernald, and M. B. Reinsdorf. 2016. *Does the United States Have a Productivity Slowdown or a Measurement Problem?* Working Paper 2016-03. Federal Reserve Bank of San Francisco.
- Brynjolfsson, E., and A. McAfee. 2014. *The Second Machine Age: Work, Progress and Prosperity in Times of Brilliant Technologies*. New York: W.W. Norton & Company.
- CBO (Congressional Budget Office). 2018. *The Budget and Economic Outlook: 2018 to 2028*. Congressional Budget Office Report (April). Washington.
- Decker, R., J. Haltiwanger, R. Jarmin, and J. Miranda. 2017. Declining Dynamism, Allocative Efficiency, and the Productivity Slowdown. *American Economic Review* 107, no. 5 (May): 322–26.

- Fernald, J. 2014. Productivity and Potential Output before, during, and after the Great Recession. *NBER Macroeconomics Annual 2014*, volume 29. Cambridge, MA: National Bureau of Economic Research.
- Fernald, J., and C. I. Jones. 2014. *The Future of US Economic Growth*. NBER Working Paper 19830. Cambridge, MA: National Bureau of Economic Research.
- German Council of Economic Experts. 2015. *Annual Report on the German Economy*. Wiesbaden.
- Goodhart, C., and M. Pradhan. 2017. *Demographics will reverse three multi-decade global trends*. BIS Working Paper No 656. Basel: Bank for International Settlements.
- Gordon, R. J. 2010. *Revisiting US Productivity Growth over the Past Century with a View of the Future*. NBER Working Paper 15834. Cambridge, MA: National Bureau of Economic Research.
- Gordon, R. J. 2012. *Is US Economic Growth Over? Faltering Innovation Confronts the Six Headwinds*. NBER Working Paper 18315. Cambridge, MA: National Bureau of Economic Research.
- Gordon, R. J. 2014. *The Demise of US Economic Growth: Restatement, Rebuttal, and Reflections*. NBER Working Paper 19895. Cambridge, MA: National Bureau of Economic Research.
- Hufbauer, G. C., and E. Jung. 2016. Why Has Trade Stopped Growing? Not Much Liberalization and Lots of Micro-Protection. Trade and Investment Policy Watch Blog, March 23. Washington: Peterson Institute of International Economic.
- IMF (International Monetary Fund). 2016a. Financial Stability Challenges in a Low-Growth, Low-Rate Era. *Global Financial Stability Report* (October): 1–48. Washington.
- IMF (International Monetary Fund). 2016b. Global Trade: What's behind the Slowdown? *World Economic Outlook* (October): 63–119. Washington.
- Jorgenson, D., and K. Vu. 2010. Potential growth of the world economy. *Journal of Policy Modeling* 32, no. 5: 615–31.
- Mokyr, J. 2014. The Next Age of Invention: Technology's Future Is Brighter than Pessimists Allow. *City Journal* (Winter): 14–20. New York: Manhattan Institute.
- Mokyr, J., C. Vickers, and N.L. Ziebarth. 2015. The History of Technological Anxiety and the Future of Economic Growth: Is This Time Different? *Journal of Economic Perspectives* 29, no. 3: 31–50.
- Nakamura, L., and R. Soloveichik. 2015. *Valuing 'Free' Media Across Countries in GDP*. Working Paper no. 15-25. Federal Reserve Bank of Philadelphia.
- OECD (Organization for Economic Cooperation and Development). 2015. *The Future of Productivity*. Paris.
- Summers, L. 2014. U.S. Economic Prospects: Secular Stagnation, Hysteresis, and the Zero Lower Bound. *Business Economics* 49, no. 2.
- Syverson, C. 2017. Challenges to Mismeasurement Explanations for the US Productivity Slowdown. *Journal of Economic Perspectives* 31, no. 2: 165–86.

