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9 stylized facts on productivity





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Achieving high productivity growth is a central goal of policymaking because productivity impacts not only on key macroeconomic variables, but also on a country's living standards and the resource inputs necessary for production. In particular, central banks have an intrinsic interest in promoting productivity given its interaction with the natural rate of interest r, which crucially shapes the monetary policy space. A variety of factors help explain weak productivity dynamics in industrial countries in the past decades. They range from low demand, expansionary monetary policy, specific firm characteristics, technological and financial market dynamics as well as demographics to the burden of regulation. In the years ahead, digital transformation and climate change may add to the list of crucial factors. To promote productivity, we will need a multifaceted and country-specific policy mix; "one-size-fits-all" policies are deemed suboptimal.*

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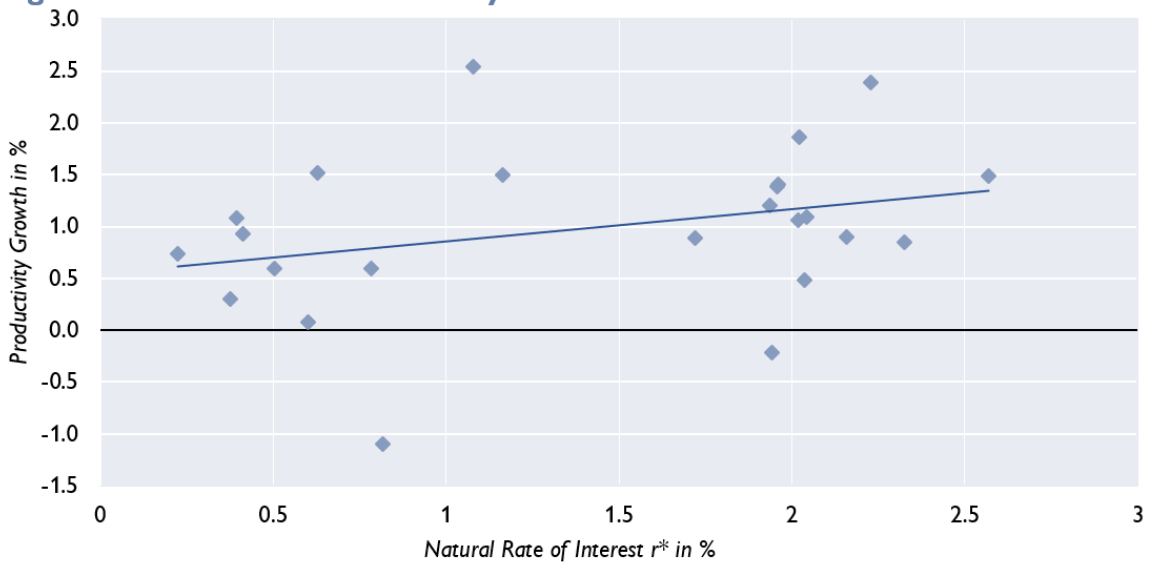
Productivity growth is key for central banks

Achieving high productivity growth is a **central goal of policymaking** in most industrialized countries. This is attributable to the key role productivity growth plays for variables such as income per capita, supply of goods and services, wage growth and international competitiveness. The lower the productivity is, the more the income level depends on resource use. This makes production processes inefficient and environmentally unsustainable.

Central banks have an intrinsic interest in promoting productivity growth because of its interaction with the **natural rate of interest r***, which crucially shapes the monetary policy space. Changes of long-run productivity growth are conjectured to impact on r* and vice versa. The slow productivity growth which we have been seeing in the current period of very low interest rates may therefore not be a coincidence. In contrast to the negative textbook relationship in the short run, higher interest rates may incentivize savings and induce larger investment returns in the long run, potentially amplifying productivity growth. In figure 1, the correlation between a common proxy of productivity growth and r* appears to be positive. However, this relationship, which strongly depends on the model specification, the employed productivity measure and the time horizon, has given rise to a plethora of studies and hypotheses, which we reviewed in Breitenfellner et al. (2022).

Figure 1: EA19 Labor Productivity Growth vs. Natural Rate of Interest



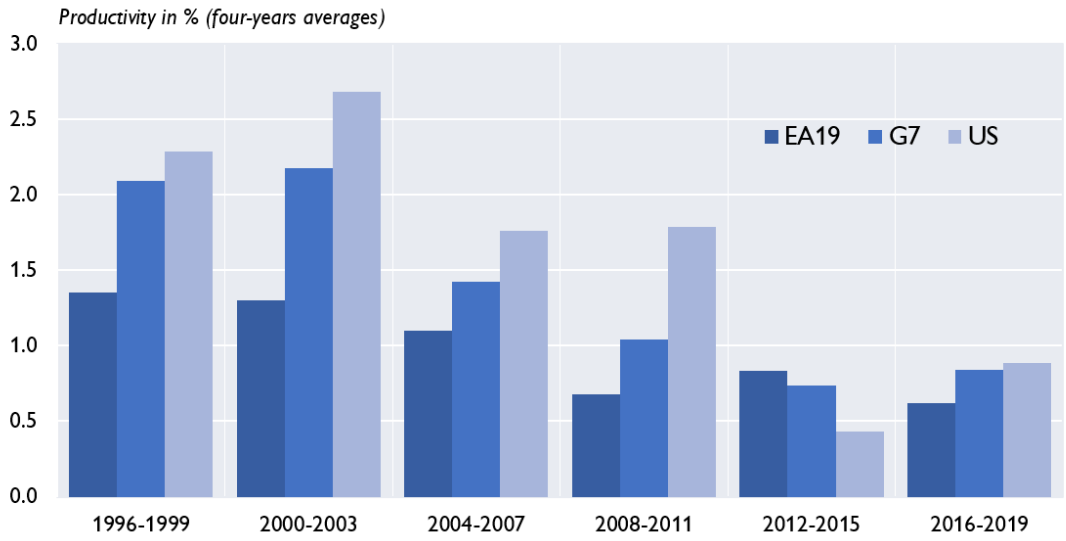
Source: OECD (2022) and Holston, Laubach and Williams (HLW, 2017).
Notes: Productivity as GDP per hour worked and HLW estimates for EA19 natural rate of interest.

"You can see the computer age everywhere but in the productivity statistics"[2]

Major advancements in production techniques in the past (e.g. the industrial revolution) had tangible positive effects on productivity growth. This is why we would also expect recent achievements to have a visible impact on productivity measures. Yet, the ongoing digital transformation notwithstanding, labor productivity growth has slowed down in advanced economies since the 1970s and has virtually stagnated since the mid-2000s (figure 2). In the euro area, annual growth in labor productivity declined from 1.1% in 1996 to below 0.6% in 2019.

[2] Solow, R. (1987): "We'd better watch out," New York Times Book Review, July 12.

Figure 2: Labor Productivity Growth (GDP per hour worked)



Source: OECD (2022) and authors' calculations.
Notes: EA19 - Euro area member states, G7 - Canada, France, Germany, Italy, Japan, UK, US, EU. Latest observation: 2019.

The **US has outperformed European countries** over the last decades, which is partly due to its stronger investment and faster implementation of **ICT-related technologies**. Factors that may have also benefited the US are demographics, higher firm dynamism and different management practices. Moreover, financial market characteristics have a role to play: in the US, especially SMEs and start-ups find it easier to avail themselves of equity-based sources of finance. **Within Europe**, we observe a **North-South gap** when it comes to productivity growth. This gap is related to differences in ICT capital intensity, the quality of public governance, the regulatory burden, the importance of SMEs and their financial constraints, and also to the efficiency of the labor market and the educational system.

The reasons for subdued productivity growth are manifold

We have surveyed the theoretical and empirical literature to learn more about the key drivers of the recent productivity slowdown. In Breitenfellner et al. (2022), we define nine hypotheses. Each tackles the productivity puzzle from a different angle. Here, we briefly summarize the main points and policy measures we suggest with a view to counteracting the negative effects on productivity:

1. **Lack of demand** leads to an underutilization of resources and hence negatively affects investment. What follows is a prolonged period of low productivity and economic growth (**secular stagnation**). Rising inequality, particularly after financial crises, may further dampen productivity. This line of argument makes a case for **strong fiscal policy**, especially income policy.

2. Long periods of **expansionary monetary policy** may have unintended side effects on productivity growth, as big firms might benefit more from low interest rates than small ones, which curbs competition and dampens investment.[3] Additionally, relaxed financing constraints may delay balance sheet repair and prolong the survival of less productive firms. So-called zombie firms lock resources and crowd out investment in more productive firms. The right mix of **micro- and macroprudential tools** and **strengthened banking supervision** including efficient insolvency regimes should help prevent the buildup of financial risks that could lead to prolonged periods of low productivity growth.

[3] Liu, E., Mian, A. and Sufi, A. (2022): "Low Interest Rates, Market Power, and Productivity Growth," Econometrica 90 (1): 193-221.

3. **Micro and small firms** tend to be less open toward foreign trade, less innovative and less digitally mature, have limited access to finance, and their labor force is less skilled – factors that constrain productivity growth. Policies should remove **barriers to firm growth** by ensuring market-based sources of finance for SMEs and promoting technical knowledge and labor mobility to provide for an efficient use of input factors.

4. As technological progress is a **dynamic phenomenon**, it may take time to apply innovations productively. Efficiently implementing new technologies requires new production and business processes. Policy should thus actively **promote and fund interdisciplinary workstreams**, which may **smooth implementation cycles** and speed up the productive employment of new technologies.

5. The recent productivity slowdown may also reflect decelerating **technological diffusion**, i.e. the pace at which innovation spreads to lagging firms. Policies should focus on promoting **management practices** and skills necessary to steer new production processes. **Innovation hubs** may help support technological diffusion, especially among SMEs. Cross-border diffusion can be accelerated via **trade integration** and skilled labor mobility.

6. The **process of creative destruction** (Schumpeter) is key to innovating, with new innovations replacing older ones, pushing the research frontier forward. Various aspects may hamper this process.[4] Targeted policies may harness the beneficial effects by **avoiding a misallocation of (physical and human) research capital** and by enabling a **business-friendly environment** (e.g. in terms of competition or labor market protection).

7. Also, **access to finance** is important for a productivity-stimulating environment. Specifically, **market-based financial structures** are tilted toward highly productive firms, offering greater flexibility. Moreover, during the life cycle of business activity, different types of finance may be necessary. As an immediate policy consequence, policymakers should foster the development and accessibility of **suitable financial structures on the capital market**.

8. The **regulatory** and **compliance burden** absorbs labor and capital resources and may create disincentives to innovate. However, too little regulation may increase the risk of financial crises. Given the high uncertainty about the **right balance**, both regulation and deregulation need to be accompanied by careful monitoring. This is especially relevant for financial sector regulation.

9. **Demographics** affect the capacity to adjust to modern technologies. Holzmann et al. (2020) emphasize the importance of **adapting labor markets** to increase incentives for delayed retirement and, thus, motivate people to invest in their skills. For one thing, this requires reforming the pension scheme (increasing the effective **retirement age** in line with life expectancy, along with moving to a **contribution-based scheme**). For another, this also calls for incentives for **life-long learning** and health measures to increase employers' interest in hiring older adults.

The importance of the various factors may change over time

While all these factors may have contributed to the past productivity puzzle, some of them may gain importance (e.g. demographics as a result of population aging), and other factors may fade (e.g. the lagged effects of the 2008/09 financial crisis). At the same time, new factors may come into play and shape future productivity trends:

[4] Aghion, P., Antonin, C. and Bunel, S. (2021): "The Power of Creative Destruction: Economic Upheaval and the Wealth of Nations", Harvard University Press.

- **Unsustainable globalization trends** may be partially reversed. Over the last decades, massive outsourcing and offshoring allowed for a concentration of business activities on core competencies and hence facilitated productivity gains. This trend is most likely not going to last. The COVID-19 pandemic and Russia's invasion of Ukraine have laid bare the vulnerabilities and risks associated with global value chain (GVC) integration and have led to a trend of **re-shoring, nearshoring** and shortening of GVCs (Silgoner, 2022), with consequences for future productivity.
- **Digital transformation** has yet to be fully reflected in productivity figures. It may take continuous digital innovation to achieve a longer-term effect on productivity growth. The coronavirus **pandemic** episode has pushed the dissemination and adoption of digital technologies to unprecedented levels (increased use of **online transactions** and platforms as well as **working from home**). This may have delivered the structural change necessary to reap the productivity gains from digital transformation. Policy can help firms exploit these gains, through subsidies for digital equipment or the buildup of digital, managerial, and organizational skills, especially in SMEs. The NextGenerationEU recovery plan may help reduce the digital divide across Europe.
- **Climate change** may dampen output growth through impacts of persistent **damages** on factors of production and total factor productivity. The **transition to a low-carbon economy** over the next three decades may reduce these negative effects through cost-effective policies such as carbon taxes and research subsidies. More optimistically, a proactive and intentionally disruptive (i.e. groundbreaking) transition toward new energy technologies may create major productivity gains through creative destruction linked with economies of scale in renewable energy. In consequence, the net effect on productivity is uncertain and may change over time as underinvestment (in non-green activities) and rising stranded (non-green) assets may only gradually be offset by efficiency gains of technological innovation and cheaper green energy.

The right policy mix relies on a multi-angle and country-specific approach

Given the manifold and time-varying reasons of subdued productivity growth, finding the right policy mix is challenging. **"One-size-fits-all" policies** are deemed **suboptimal** to combat weak productivity growth. The relative weight of appropriate measures depends on the current stage of a country's development as well as its history and the prevailing business environment. Hence, policies may differ widely across regions.

Given **central banks**' intrinsic interest in the level and trend of productivity, they **may play an active role in promoting productivity** and its measurement and thus supporting policymakers to find the right policy mix. They can do so (1) by giving well-founded advice to policymakers and by promoting rigorous monitoring and evaluation of productivity-enhancing measures; (2) by helping advance research in areas of importance for future productivity growth; and (3) by initiating and funding projects to better exploit existing data sources and collect new data, while specifically using the increasing availability and accessibility of firm-level data.

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