2. LAGGING BEHIND: PRODUCTIVITY GROWTH IN THE EUROZONE AND THE USA

Juan F. Jimeno
(Banco de España, Universidad de Alcalá, CEPR, CEMFI, Spanish National Productivity Board)

ABSTRACT

Productivity slowed down both in the Eurozone and the USA. Although there seems to be common trends, the gap in productivity levels between both areas is widening, with Europe lagging behind. This paper documents the recent productivity performance of the USA and the EU, focusing, first, on the differences in the contributions of productivity to GDP growth, and, secondly, on the sectoral composition of GDP and investment. It also discusses the main drivers of productivity -such as technological adoption and innovations in automation, artificial intelligence, and digital infrastructure, investment in physical, human, and intangible capital, market flexibility and the regulatory environment-, and how technological and demographic trends may condition productivity growth in the next decades.

1. INTRODUCTION

Productivity growth is the only feasible source of sustained economic growth and social welfare over the long run, as increases in income and consumption per capita, leisure time, and resources for public policies can only arise from higher productivity.

Concerns about the widening productivity gap between Europe and USA came to take predominance on the policy agenda of EU countries a decade ago. For instance, in September 2016 the Council of the EU recognized that "raising productivity is a multi-faceted challenge which requires a set of well-balanced policies aimed, in particular,

at supporting innovation, increasing skills, reducing rigidities in the labor and product markets, as well as allowing a better allocation of resources", and recommended to Member States the establishments of National Productivity Boards (NPB) with the goals of "track developments and inform the national debate(s) in the field of productivity and competitiveness…(so that they) contribute to the enhancement of ownership of the necessary policies and reforms at national level and to improving the knowledge basis for Union economic policy coordination".[1]

Nowadays, nine years later, concerns about the lack of productivity growth in Europe are even more acute. Nineteen EU countries have established National Productivity Boards to improve diagnostics and recommend productivity-enhancing policies.[2] And, as forcefully expressed in the reports by Mario Draghi and Enrico Letta, the only way to maintain Europe's fundamental values, such as prosperity, equity, freedom, peace, and democracy in a sustainable environment, is to grow by increasing productivity.[3] To a large extent as a response to the Draghi and Letta reports, in January 2025, the Commission presented the so-called *Competitiveness Compass,* a new roadmap to restore Europe's dynamism and boost economic growth.[4]

Beyond the crucial role of productivity to sustain economic growth, there are two other reasons for concern. One is that the economic recovery after the Covid-19 crisis has shown more dynamism in USA than in Europe, so that the gap in income per capita has widened. Another is that in a context of demographic decline and ageing of the labor force, productivity growth is even more crucial, as an increase of the weight of older population in total population implies, ceteris paribus, a decline in income per capita.

Productivity slowdown is also a phenomenon observed in the USA, so that there seems to be common trends in both areas. However, the more dismal European performance in this respect calls for a rigorous comparison to identify the main drivers of productivity that are behind the productivity slowdown, and to suggest policy recommendations to impulse productivity growth. This chapter addresses this comparison. After a brief description of historical backgrounds, we present recent data on productivity growth in Europe and in USA. As explanations of the widening gap between both areas, potential culprits are differences in the main drivers of productivity such as technological adoption and innovations in automation, artificial intelligence, and digital infrastructure, investment in physical, human, and intangible capital, market flexibility and the regulatory environment, and demographic factors.

[1] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32016H0924%2801%29

[2] https://economy-finance.ec.europa.eu/economic-and-fiscal-governance/eu-assessment-and-monitoring-national-economic-policies/evolution-eu-economic-governance/national-productivity-boards_en

[3] Draghi, M. (2024), The future of European competitiveness. Letta, E. (2024), Much more than a market.

[4] https://ec.europa.eu/commission/presscorner/detail/en/ip_25_339

2. PRODUCTIVITY GROWTH IN EUROPE AND US: HISTORICAL CONTEXT

Figure 1 reports on the long-run trends in GDP per capita, labor productivity, TFP and hours worked per employee in the Euro-zone and USA during the period 1890-2022.[5] In both areas, GDP per capita grew at an average annual rate of 2,1%. In broad terms, there were two subperiods when GDP grew above trend: 1890-1914 and the last third of the XX Century. However, during the last decade, GDP per capita growth was below trend both in Europe and in USA.

As for GDP per hour worked, average annual growth rates were 2,3 in USA and 2,6 in the Euro-zone, while for TFP the corresponding figure is 1,8% in both areas. The two measures of productivity show convergence of the Euro-zone to USA levels by the end of the XX Century. From then on, productivity in Europe started to lag, even though during over the same period in the USA labor productivity and TFP growth were below trends.

Finally, hours worked per employee declined at an average annual rate of 0,42% in USA and 0,54% in the Euro-zone, so that, by 2022 Europeans worked about 13% less hours. Sources of this difference in labor supply are higher taxes in Europe, most importantly to the effect of the marginal tax rate on labor income (Prescott, 2010), and differences in weeks worked, in the educational composition, lower weekly hours worked in Scandinavia and Western Europe, and lower employment rates in Eastern and Southern Europe (Bick et al. 2019).

These long-run trends are relevant for three reasons. One is that they "show" instead of "showed" the long-run implications of sustained productivity growth. Minor changes in growth rates sustained over longer periods result in large increases of productivity levels. Another is that they highlight periods of growth below trend, and, hence, they provide hints for identifying the main drivers of productivity growth. Finally, they show how the widening gaps in productivity and hours worked per employee between Europe and USA translate into (about one third) lower GDP per capita.

3. PRODUCTIVITY AND GDP GROWTH IN EUROPE AND USA

There are three main facts about the different productivity performance of Europe versus the USA in the XXI Century. One is that productivity growth has been higher and contributed more to GDP growth in USA than in Europe. Another is that the better productivity performance in USA is mostly to be found in service sectors, particularly those with a higher technological content. Finally, since the COVID-19 crisis the productivity gap between USA and Europe is widening. We now document these three main facts.

[5] Data are from Bergeaud, Cette, and Lecat (2016). A more detailed account of productivity growth in Europe since 1890 can be found in Bergeaud (2024).

3.1. SOURCES OF GDP GROWTH IN EUROPE AND IN THE USA

There are only three ways to increase production of goods and services: i) to employ more and/or better labor, ii) to use more and/or better capital, and iii) to increase Total Factor Productivity, TFP, (i.e., the results from the complementarity between capital and labor).[6] Hence, the productivity advantage of USA with respect to Europe can only stem from three sources: i) More human capital (higher levels of education and skill development), ii) higher investment and/or a better composition of capital (use of more advanced technologies, more intangible capital, better financial conditions to provide those investments,..) and iii) better regulatory environments, labor market dynamics, and more investment in R&D, which are the main factors driving TFP.[7]

Under these premises, growth accounting (breakdown of GDP growth in the three factors above) provides the most intuitive and transparent way to document all these factors driving the differences between productivity growth between Europe and USA.

Data from EUKLEMS-INTANProd, the most comprehensive cross-country data set with information on all sources of economic growth, allow to compute the contributions of the number of hours worked and changes in the composition of employment (as a proxy of changes in labor efficiency), of investments in three types of capital: intangible, tangible ICT (Information and Communication Technologies) and tangible non-ICT, and, finally, TFP.[8]

Table 1 summarizes the main results during the period 1996-2021 in US, and four major Eurozone economies (Germany, France, Italy, and Spain).[9] First, the GDP average growth rate of the US economy is almost twice the growth rates of Germany, France, Italy, and Spain.[10] Secondly, despite the growth slowdown since 2007 in both areas, the gap between US and the four major Eurozone countries widens even more. Thirdly, the contribution of TFP has declined over time. Fourthly, the main factors that explain higher growth in the US are higher TFP growth (which has been even negative in Italy and Spain), and higher investment in all types of capital, especially in tangible ICT and intangible capital. The contribution of labor quality has also been lower in the European countries than in the US.

Summing up, among all the factors that contribute to higher GDP growth, the major four eurozone countries lagged in all of them. Hence, as previously found by Bart van Ark, O'Mahony, and Timmer (2008), the gap in productivity between US and Eurozone

[6] In the words of Jovanovic (2000), economic growth arises from the growth of knowledge and good economic incentives.

[7] For instance, by 2022, the USA was spending 5% of its GDP on tech investment, while the eurozone was spending only 2.8%. Similarly, the USA spent 3.5% of its GDP on R&D compared to the eurozone's 2.3%.

[8] See Bontadini et al. (2023).

[9] Data are available at https://euklems-intanprod-llee.luiss.it/. The latest year available, with full information, is 2021. Germany, France, Italy, and Spain are aggregated into Eurozone-4 with weights 0.4, 0.26, 0.19, and 0.14, respectively.

[10] Only Spain was close to register similar growth rates as the USA during the first half of the period (1996-2007), the years of the housing bubble.

countries continues to arise from slower adoption of the knowledge economy, lower investment in information and communication technology (ICT), and slower multi-factor productivity growth in Europe. Overall, the slower emergence of the knowledge economy combined with worse firm dynamics (survival of unproductive "zombie firms" that continue to operate and lower entry of new, dynamic firms) and slower technology diffusion are the main roots of the productivity gap between Europe and the USA.

3.2. SECTORIAL DIFFERENCES IN PRODUCTIVITY GROWTH BETWEEN EUROPE AND USA

Productivity may increase by either higher efficiency of production factors and higher TFP in each sector of the economy or by reallocation of resources from less productive to more productive sectors of activity. Similarly, cross-country differences in productivity may be due to differences in productivity within sectors or by differences of the relative importance of more productive sectors. In the shorter-term, intra-sector productivity growth dominates, while in the longer-term reallocation of resources towards more productive sectors (i.e., structural change) is a powerful source of growth.

As for changes across time, standard shift-share analysis concludes that intra-sectors changes in productivity are the main drivers of productivity growth in USA and the Eurozone.[11] For instance, the manufacturing sector in the USA has seen moderate productivity growth, but still higher than in the euro area, where productivity growth was slower, with some countries even facing stagnation. In the retail sector, the USA shows a better performance in e-commerce and efficient supply chain management, in contrast with Europe, where differences in market structure and more conservative consumer behavior slowed down productivity growth in these sectors. In any case, it is the IT sector the main powerhouse of productivity growth in USA, favored by significant investments in R&D, venture capital investments, and a strong innovation ecosystem, while in Europe lower investments, less appetite for risky investments, and excessive regulation retarded productivity growth, especially in more technologically oriented sectors.

As simple illustrations of the sectoral differences in growth between the USA and the four major Eurozone countries, Figures 2 and 3 show that the main differences in the contributions of TFP and intangible capital to growth by sectors between the USA and the four major economies of the eurozone are concentrated in a few sectors close to Information, Communication Technologies, such as Fabrication of Computer, Electronic, and Optical Products and Electrical Equipment and Computer programming, Consultancy, and Information Services (see Appendix for the lists of sectors in the Figures). This sectoral composition of GDP and investment gives the USA leads in Digitally Enabled Services (cloud computing and data storage, Software licensing and SaaS platforms, Digital content distribution, e.g., streaming services, Telecommunication and cybersecurity services, Remote diagnostics and telehealth platforms) ICT-Producing In-

[11] See López and Szörfi (2021) and Dias da Silva et al. (2024).

dustries (semiconductors and microprocessors, enterprise software, operating systems and platforms, and AI and machine learning platforms), ICT-Use-Intensive Industries (finance and insurance, e.g., fintech platforms, algorithmic trading, E-commerce and logistics, healthcare IT, and advanced manufacturing), and Intellectual Property and R&D Services (licenses for software and industrial designs, R&D services tied to ICT and high-tech manufacturing, and patents and trademarks related to digital technologies). Among all of these, the ICT-intensive sectors that the Draghi's report (2024) highlights as strategic for the future of Europe competitiveness are, together with energy, critical raw materials, defense, and transport, Digitalization and Advanced technologies, High speed/capacity broadband networks, Computing and AI, Semiconductors, Space, and Pharma.

3.3. PRODUCTIVITY GROWTH IN EUROPE AND USA DURING 2021-2024

The post-pandemic period has also witnessed a widening of the gaps, both in GDP and productivity growth, between USA and the eurozone, as can be seen in Figure 4 that provides the decomposition of GDP growth in the contributions of labor (working hours and improvements in labor quality), capital (aggregate and utilization rate), and Total Factor Productivity. Over this period the average annual growth rate of TFP has been 0,43% in USA (similar to the one registered during 2008-2019), and 0,11% in the Eurozone four major economies (significantly lower than the one registered for the 2008-2021, that is 0,7%).

Over short periods of time, both structural and cyclical factors drive productivity growth. Hence, assessment of the productivity performance during the recent period of economic recovery (2021-2024) should take into account the relevant economic shocks during the pandemics and afterwards (disruption of global supply chains, Ukraine war, increasing energy prices, surge in inflation).

Moreover, labor hoarding during the pandemics, and labor reallocation afterwards, ought to have generated higher volatility in labor and TFP productivity. Labor hoarding makes labor productivity pro-cyclical, that is, higher when demand is higher. Labor reallocation also impulses productivity, as labor flows from low to higher productivity jobs. Hence, after the pandemics, labor hoarding and reallocation conceivably stimulated productivity growth. However, as seen in Figure 4, whereas 2021 and 2023 were years of positive TFP growth in the USA, in the major four European countries, it is only in 2023 and 2024 when TFP growth registered positive figures. Thus, the USA has been more effective in adapting to new economic conditions post-pandemic, while Europe has struggled with slower recovery and adaptation to the changes in the economic scenario.

4. LOOKING AHEAD: MAIN CHALLENGES TO SUSTAINED GROWTH

The drivers of productivity growth could be classified into three categories: i) factors

that increase the efficiency of labor, ii) factors enhancing the efficiency of capital, and) drivers of TFP. Investments in human capital that increase labor quality, and investment in technology and intangibles that increase the efficiency of capital are the main productivity drivers in the first two categories. Regulation and social capital (i.e., a broad concept related to institutional quality) that affect to the allocation of resources and to the complementarities between capital and labor are in the third category. The latter is especially relevant for the sectoral composition of production. For instance, the degree of market competition, barriers to entry and to firm growth, liquidation of less productive firms, and quality of labor relations determine firm dynamics (which firms are created, destroyed and which ones grow) and, hence, productivity growth by allocation of production factors to more efficient firms. Finally, from a firm perspective, technology, innovation, specific labor skills, quality of management, and supply chains are the main dimensions on which to assess productivity growth.

Conventional wisdom is that the main reasons of Europe lagging behind the USA in productivity growth are to be found in lower investments in technological, R&D, and intangible capital, less innovation and diffusion of new technologies, regulation that restrict competition and opportunities for creation and growth of productive firms, mainly by maintaining a segmented market, and less availability of funding (mainly, risk capital) for the creation and scale-up of new ideas, joint-ventures and new technological firms (Letta, 2024, and Draghi, 2024). Thus, structural reforms to boost innovation and investment are the main levers to close the productivity gap between the USA and the EU. They should be targeted towards reducing market fragmentation, enhancing human capital, improving infrastructure, increasing the quality of regulation both in the labor and in the product and services markets, and eliminating fiscal distortions to encourage investment and entrepreneurship. In all these dimensions there is substantial heterogeneity across EU countries, so that co-ordination among them is also crucial for the correct design and implementation of structural reforms.

Looking ahead, two structural trends will condition economic growth in the near decades. One has to do with the developments and adoption of technologies associated with robotics and artificial intelligence. Another is a radically changing demographic scenario, with declining and ageing labor forces.

On the impact of AI and robotics on productivity, there is wide uncertainty. Estimates range from an annual increase of 0,07 pp (Acemoglu, 2025) to 1,3 pp (Aghion and Bunel, 2024). The uncertainty comes from different assessments of the productive tasks that could be conducted by AI, in how many of those tasks it could be profitable to replace human labor by AI, and how much productivity will increase as a results of AI implementation. What is being observed so far is that, first, AI technologies are not so much substituting human labor as they are complementing skilled workers, so that productivity effects would not be much different as those derived from digitalization and adoption of ICT (Albanesi et al., 2025), and, secondly, that Europe has lost the race in the development of Large Language Models - that are the foundations of Generative AI- to USA and China, and European firms are slower in the adoption of AI (Hazan et al., 2024).

As for demographics, prospects are that, at least during the remaining first half of this Century, population ageing will accelerate, with profound consequences in the age structure of the working population. As seen in Figure 5, the average ages of the working-age population (20-69), that is nowadays almost 2 years higher in the Eurozone than in the USA, will increase by about 1 year and 1,5 years, respectively up to the mid-Century. These increases do not provide a full picture of the drastic change in the age structure of the working-age population. For instance, the ratio of young workers (20-39) to older workers (40-69), which is significantly higher in the USA than in the Eurozone, will decrease by 13 pp and 5 pp, respectively, up to 2060.

In a demographic scenario under which working-age populations are going to decline significantly over the next decades, productivity growth becomes even more important to sustain levels of GDP per capita and to continue reducing working hours per employee. Additionally, ageing of the working-age population slow down productivity growth by three channels. One is the result of the age composition effect when productivity growth is lower at the later years of the working life. Another is that productivity growth is lower for all age-groups in countries where population is older. This effect arises through effects on innovation, entrepreneurship, and firm dynamics. For instance, Aksoy et al. (2019) using an endogenous growth model conclude that the current trends of population aging and low fertility are projected to reduce output growth, investment, and real interest rates across all OECD countries. Finally, productivity growth is mostly based on the complementarities among production factors, including the complementarity between young and older workers, which is likely to be diminished in a scenario with a less balanced age structure of the working-age population.

5. CONCLUDING REMARKS

Productivity growth is the only source of sustained increases in GDP per capita and leisure time, which are positively correlated with (almost) all indicators of social welfare that could be considered. The Eurozone registered poor productivity growth since the beginning of this Century, and, although productivity growth has slowed down in the USA, over the same period, the gap between the two zones has widened. In a context of technological change and population ageing, the issue of how to achieve higher productivity growth has become crucial to sustain social welfare in Europe.

Which products and services are produced and how they are produced are at the roots of aggregate productivity. Complementarities among production factors and economic regulations that provides the right incentives for investment and enhancing efficiency are also key for consolidating environment that favors productivity growth.

Good news is that productivity has arrived at the center of economic policy agenda. After being somehow disregarded in the debates about economic policies, in the last decade new institutions such as the National Productivity Boards, established in 19 EU countries after a recommendation of the EU Council, and recent keynote reports on

productivity and competitiveness in the EU (Draghi, 2024, Letta, 2024) are contributing to improving the analysis of productivity in policy areas and to provide guidelines about how to impulse productivity growth in Europe.

Bad news are that Europe seems to be adapting to new technological changes at a lower speed than USA and China and that demographics prospects are not favorable to productivity growth. The adoption and implementation of AI technologies in the production of goods and services require the investments and efficient regulation of which Europe has been recently lacking. Population ageing is not going to be reverted and its negative impact on economic growth could be significant. These two conditions imply that the policy concerns to impulse productivity growth in Europe should be even more prevalent.

REFERENCES

Acemoglu, D. (2025) "The simple macroeconomics of AI" Economic Policy, Volume 40, 121, pages 13–58, https://doi.org/10.1093/epolic/eiae042

Aghion, P., and S. Bunel (2024) "AI and Growth: Where Do We Stand?", mimeo, https://www.dropbox.com/scl/fi/s39aefeaximl8yudcgbmf/ab_ai_growth.pdf?rlkey=2uq2k1ovmrywmn75iy1bgjvrv&e=1&dl=0

Aksoy, Y., H. S. Basso, R. P. Smith, and T. Grasl (2019) "Demographic Structure and Macroeconomic Trends." American Economic Journal: Macroeconomics 11 (1): 193–222. DOI: 10.1257/mac.20170114

Albanesi, S., A. Dias da Silva, J. F. Jimeno, A. Lamo, A. Wabitsch (2025) "New technologies and jobs in Europe" Economic Policy, Volume 40, 121, pages 71–139, https://doi.org/10.1093/epolic/eiae058

Bergeaud, A. (2024): "The past, present and future of European productivity", POID working paper, No. 103.

Bergeaud, A., G. Cette, and R. Lecat (2016): "Productivity Trends in Advanced Countries between 1890 and 2012", Review of Income and Wealth. vol. 62(3), pages 420–444.

Bick, A., Brüggeman, B., Fuchs-Shündeln, N. (2019): "Hours Worked in Europe and the United States: New Data, New Answers", The Scandinavian Journal of Economics, vol. 121, 4, pages 1381-1416. https://doi.org/10.1111/sjoe.12344

Bontadini, F. Corrado, C., Haskel, J. Iommi, M., and Jona-Lasinio, C. (2023): "EUKLEMS & INTANProd: Industry productivity accounts with intangibles", https://euklems-intanprod-llee.luiss.it/wp-content/uploads/2023/02/EUKLEMS_INTANProd_D2.3.1.pdf

Dias da Silva, A., P. Di Casola, R. Gomez-Salvador and M. Mohr (2024): "Labour productivity growth in the euro area and the United States: short and long-term developments". ECB Economic Bulletin, Issue 6/2024.

Draghi, M. (2024), The Future of European Competitiveness", EU Commission, https://commission.europa.eu/topics/eu-competitiveness/draghi-report_en

Hazan, E., A. Madgavkar, M. Chui, S. Smit, D. Maor, G. Singh Dandona, and R. Huyghues-Despointes (2024): "A new future of work: The race to deploy AI and raise skills in Europe and beyond", McKinsey Global Institute. https://www.mckinsey.com/mgi/our-research/a-new-future-of-work-the-race-to-deploy-ai-and-raise-skills-in-europe-and-beyond

Jimeno, J.F. and A. Lamo (2024): "Artificial Intelligence and Human Capital: Are Complementarities at Risk?" en Juan José Ganuza y Antonio Cabrales (coordinators), Beyond Ivory Tower. Navigating Higher Education in the Future, Funcas Social and Economic Studies, 10 https://www.funcas.es/articulos/artificial-intelligence-and-human-capital-are-complementarities-at-risk/

Jovanovic, B. (2000): "Growth theory", NBER working paper 7468.

Letta, E. (2024), Much more than a market, EU Commission

https://www.consilium.europa.eu/media/ny3j24sm/much-more-than-a-market-report-by-enrico-letta.pdf

Lopez-Garcia, P. and Bela Szörfi (2021): "Key factors behind productivity trends in euro area countries". ECB Economic Bulletin, Issue 7/2021.

Prescott, E.C. (2004): "Why Do Americans Work So Much than Europeans?", NBER working paper 10316.

van Ark, Bart, Mary O'Mahoney, and Marcel P. Timmer (2008). "The Productivity Gap between Europe and the United States: Trends and Causes." Journal of Economic Perspectives 22 (1): 25–44. DOI: 10.1257/jep.22.1.25.

APPENDIX.

List of sectors and codes in Figures 2 and 3.

Sector	Sector_code
Agriculture, Forestry, and Fishing	A
Mining and Quarrying	B
Manufacturing	C
Food, Beverages and Tobacco	C10-C12
Textiles	C13-C15
Woods and Printing	C16-C18
Coke and Refined Petroleum Products	C19
Basic Chemicals	C20
Basic Chemicals and Pharmaceutical Products	C20-C21
Pharmaceutical Products	C21
Rubber and Plastics	C22-C23
Basic Metals and Fabricated Metal Products	C24-C25
Computer, Electronic, and Optical Products	C26
Computer, Electronic, and Optical Products and Electrical Equipment	C26-C27
Electrical Equipment	C27
Machinery and Equipment	C28
Motor Vehicles and Transport Equipment	C29-C30
Furniture, Repair and Other Manufacturing	C31-C33
Electricity, Gas, Steam, and Air Conditioning Supply	D
Electricity, Gas, Steam, Air Conditioning and Water Supply	D-E
Water supply	E
Construction	F
Trade	G
Sale of Motor Vehicles	G45
Wholesale, except Motor Vehicles	G46
Retail trade	G47
Transportation and Storage	H

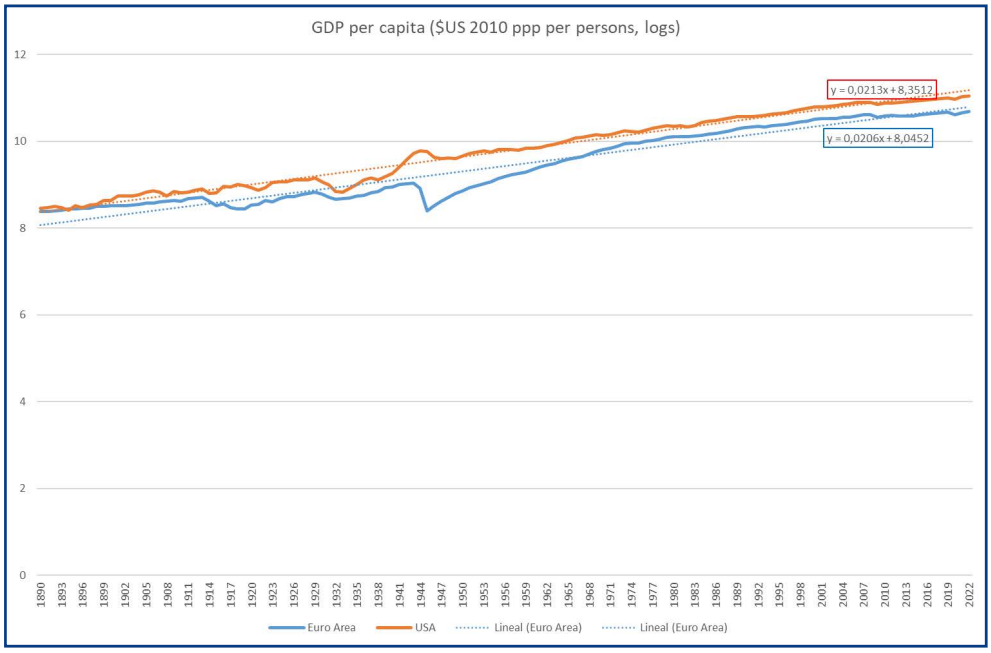
Land transportation	H49
Water transport	H50
Air transport	H51
Warehousing and support activities for transportation	H52
Postal and Courier activities	H53
Accomodation and Food Service Activities	I
Information and Communication	J
Publishing, motion pictures, and broadcasting services	J58-J60
Telecomunications	J61
Computer programming, Consultancy, and Information Services	J62-J63
Finance and Insurance Activities	K
Real State Activities	L
Buying and Selling of Own Real State	L68A
Professional, Scientific, and Technical Activities	M
Professional, Scientific, Technical Activities, and Administrative and Support Service Activities	M-N
Marketing	MARKT
Marketing and Advertising Agencies	MARKTxAG
Administrative Support Services	N
Public Administration and Defense; Compulsory Social Security	O
Public Adminsitration, Education and Health	O-Q
Education	P
Health	Q
Human Health Activities	Q86
Residential Care and Social Work Activities	Q87-Q88
Arts, Entertainment, and Recreation	R
Arts, Entertainment, Recreation, and Other Service Activities	R-S
Other Service Activities	S
Household and Domestic Services	T
Total	TOT
Total_Manufacturing	TOT_IND
Activities of Terriotorial Organizations	U

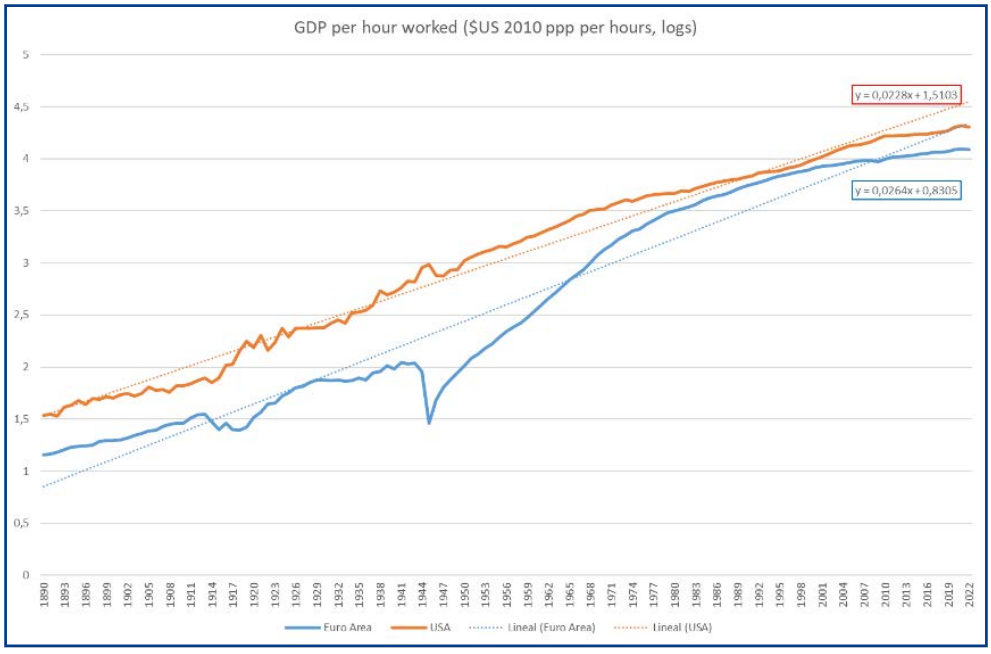
Table 1. Growth accounting, pp, 1996-2021.
Eurozone-4 (Germany, France, Italy, and Spain) and USA

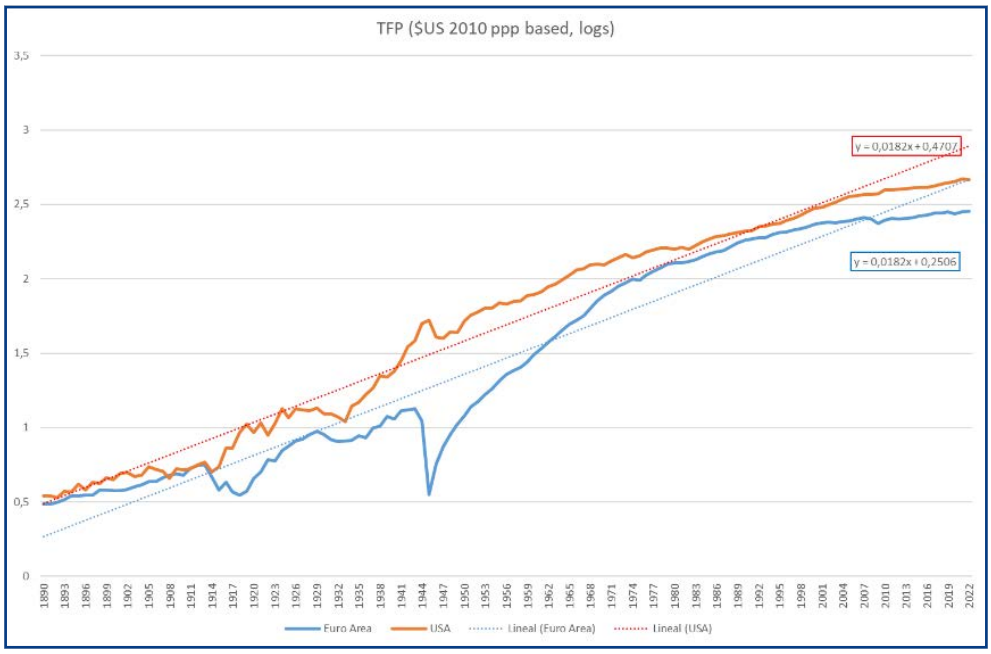
	Eurozone-4			USA		
	1996-2021	1996-2007	2008-2021	1996-2021	1996-2007	2008-2021
GDP growth rate	1,6	1,7	0,7	2.8	3.7	2
Labor input (Hours)	0,4	0,2	0,0	0,4	0,6	0,1
Labor input (Composition)	0,2	0,2	0,3	0,2	0,2	0,3
Capital-Tangible ICT	0,0	0,0	0,0	0,2	0,4	0,1
Capital-Tangible NICT	0,5	0,5	0,2	0,5	0,6	0,3
Capital-Intangible	0,3	0,3	0,3	0,7	0,6	0,7
TFP	0,1	0,5	-0,1	0,9	1,4	0,4

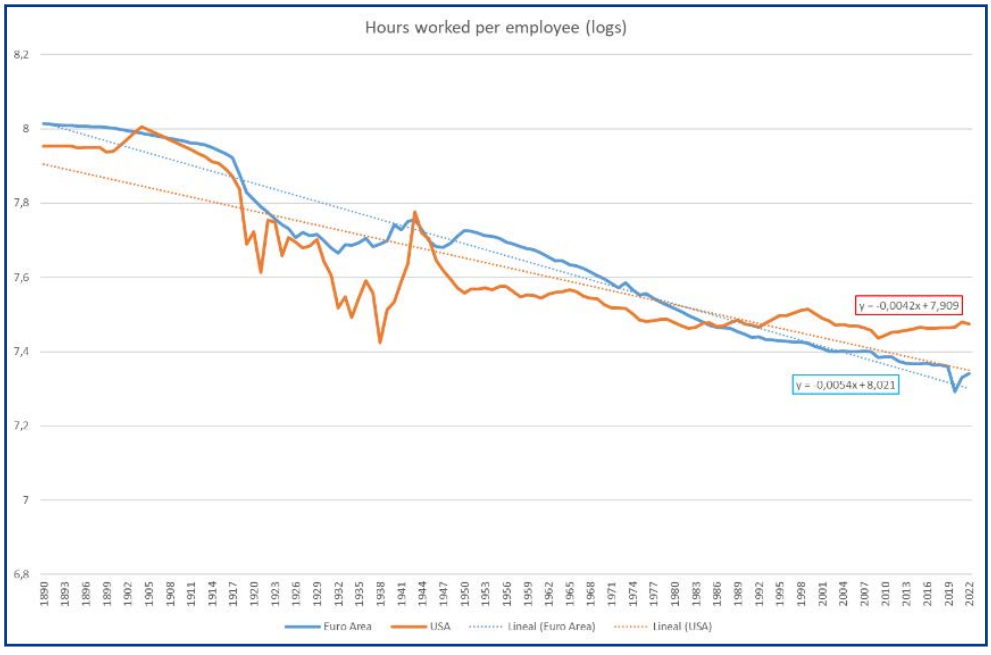
Source: EUKLEMS-INTANProd Database. https://euklems-intanprod-llee.luiss.it/

Figure 1. GDP per capita, Hours worked per employee, Labour Productivity and Total Factor Productivity



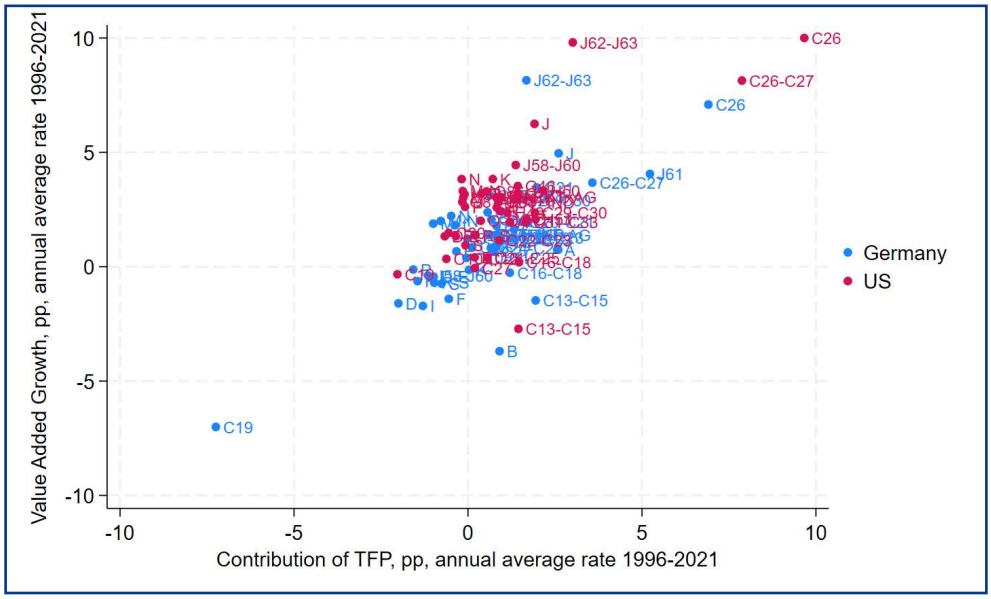


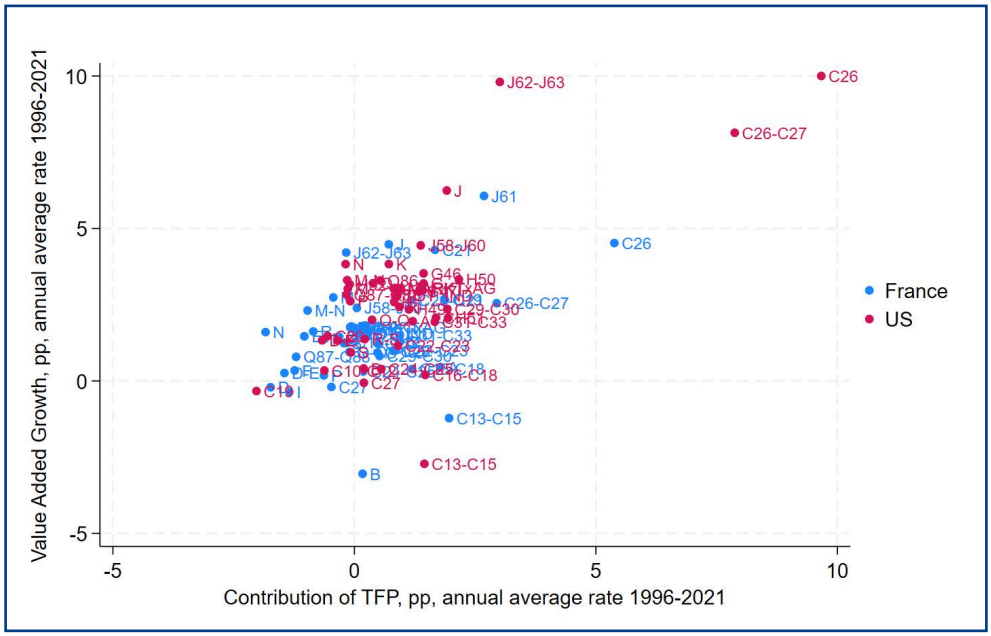


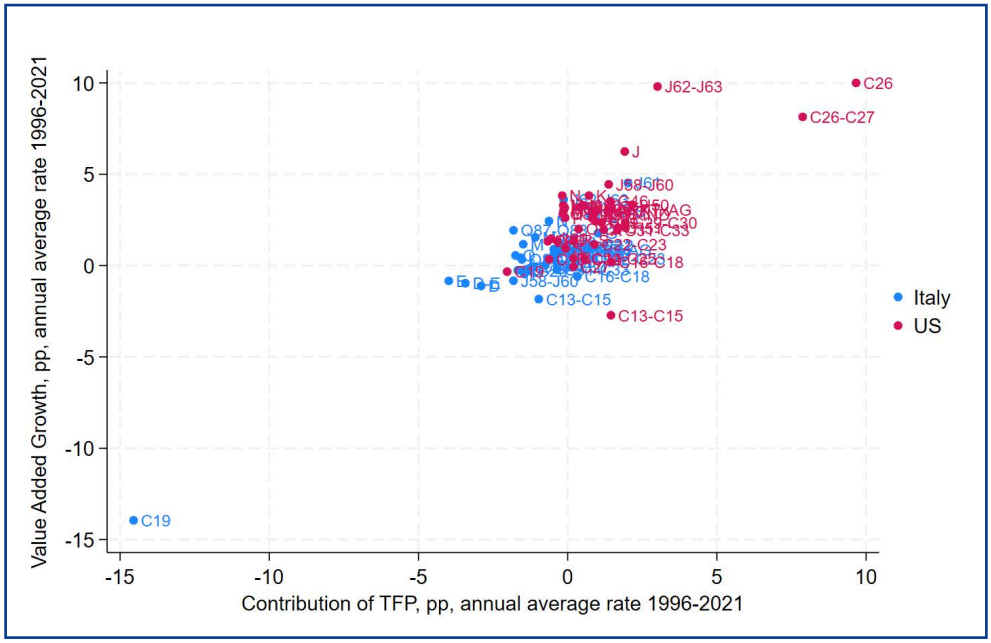


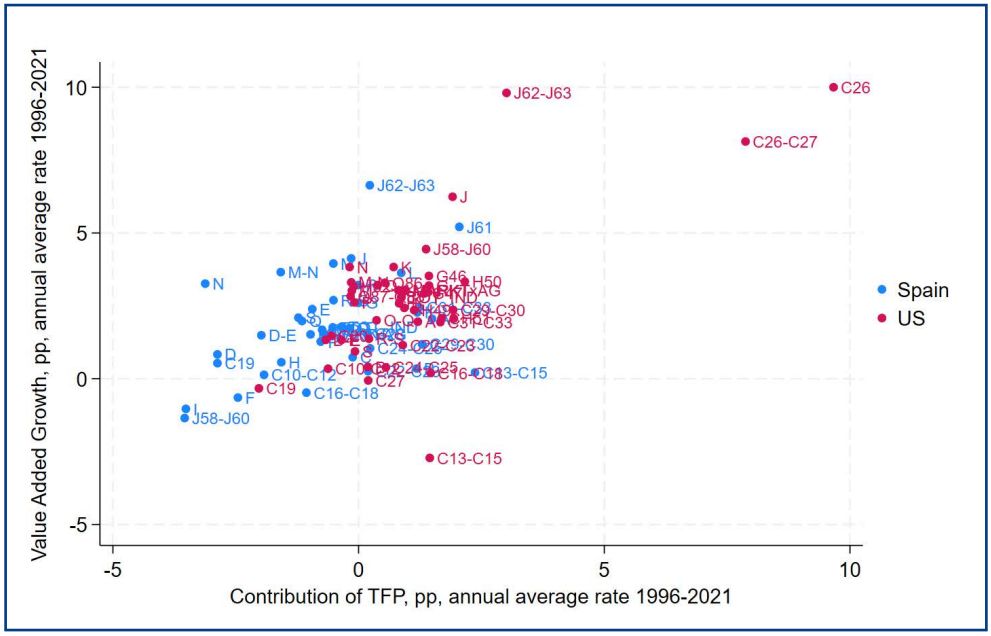
Source: http://www.longtermproductivity.com/

Figure 2. Growth and Contribution of TFP by sectors of activity, pp, 1996-2021. USA, Germany, France, Italy, and Spain.



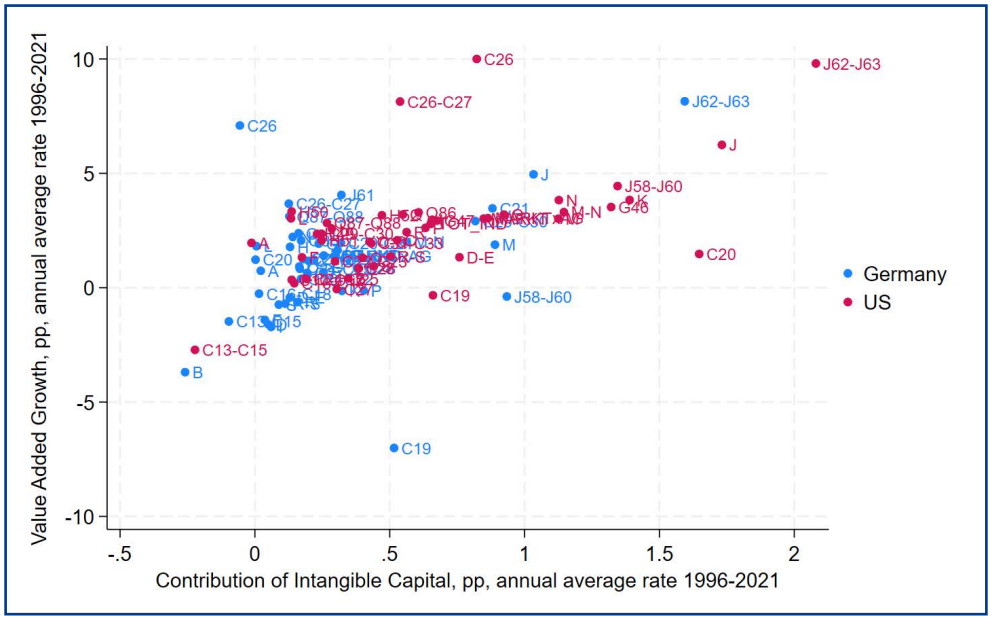


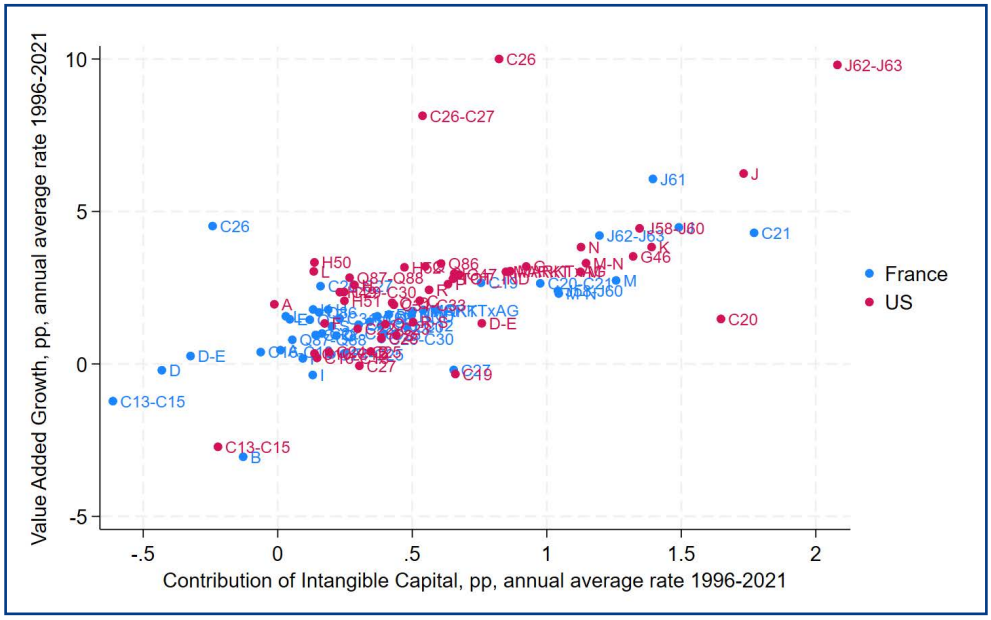


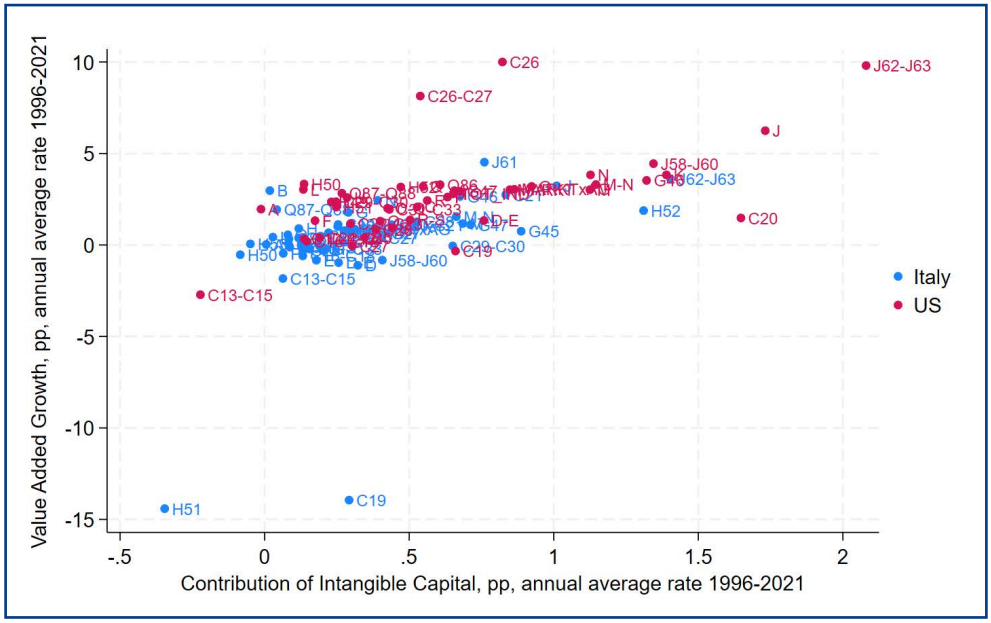


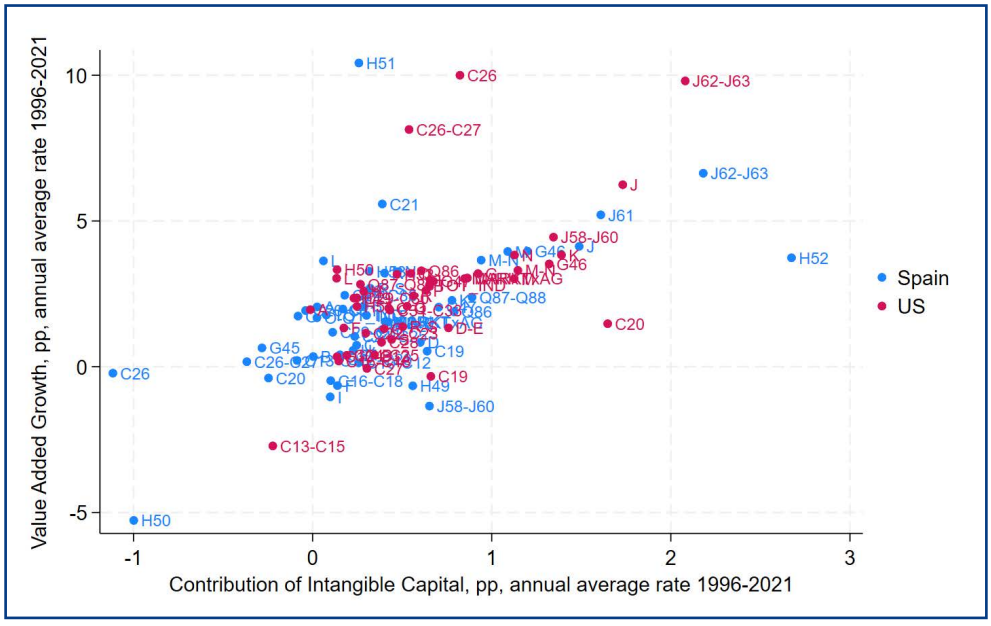
Source: EUKLEMS-INTANProd Database. https://euklems-intanprod-llee.luiss.it/

Figure 3. Growth and Contribution of Intangible Capital by sectors of activity, pp, 1996-2021. USA, Germany, France, Italy, and Spain.



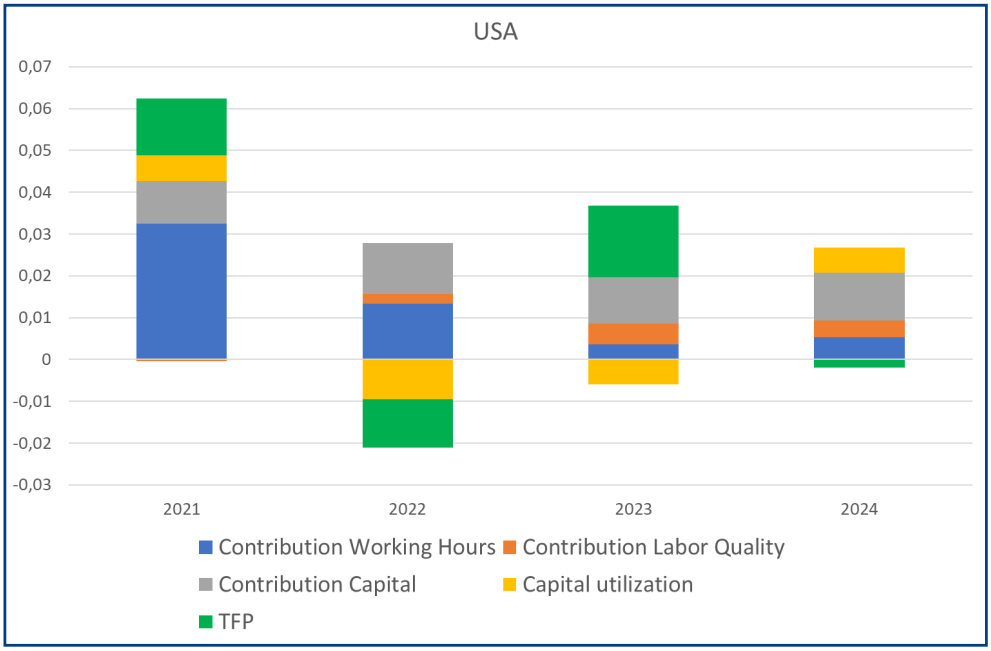


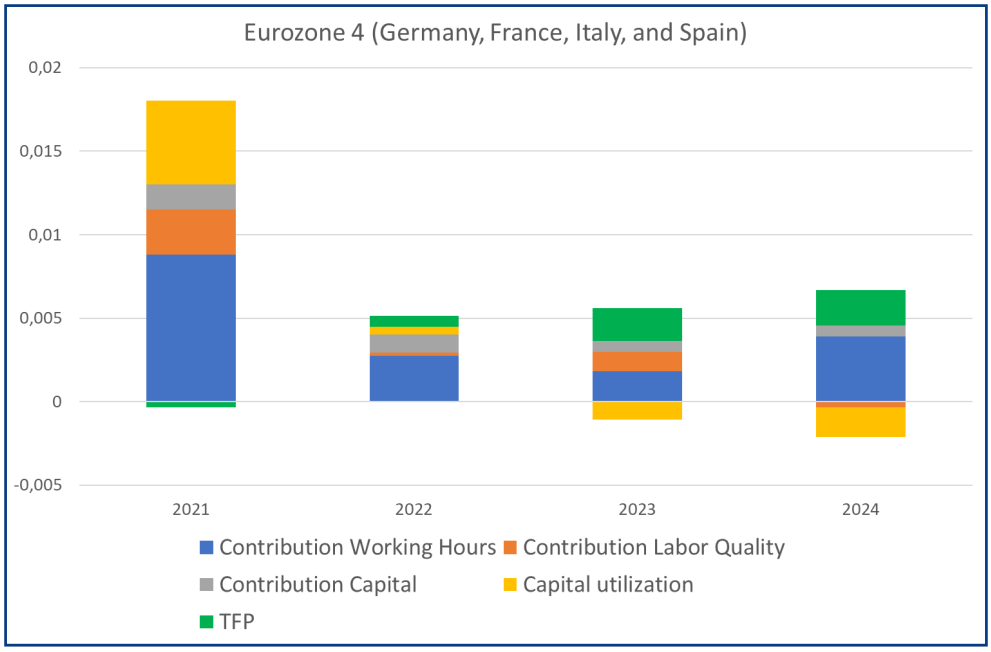




Source: EUKLEMS-INTANProd Database. https://euklems-intanprod-llee.luiss.it/

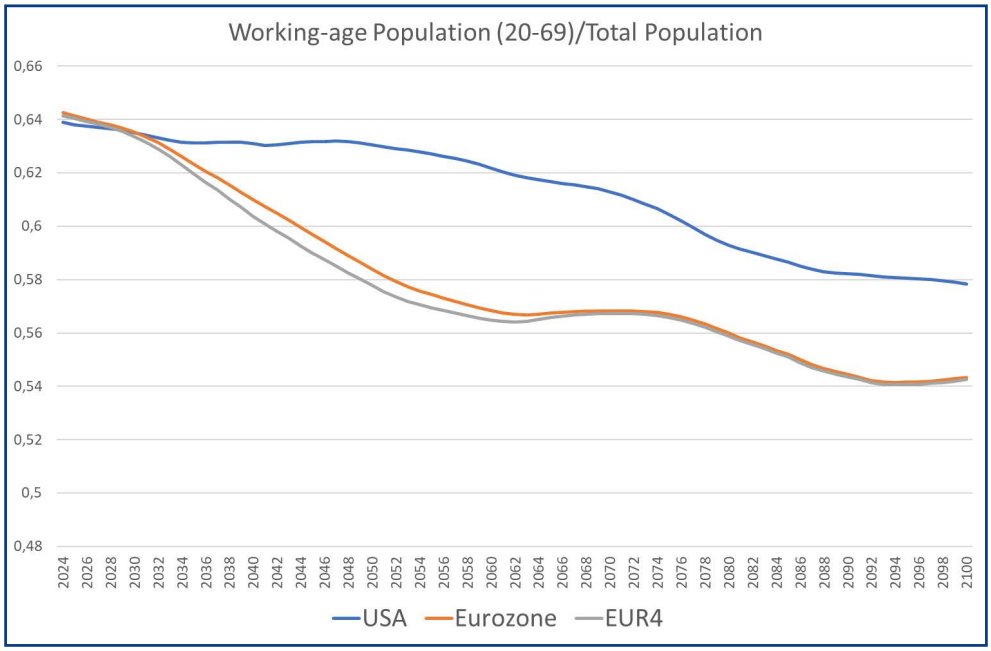
Figure 4. Decomposition of GDP growth, 2021-2024.

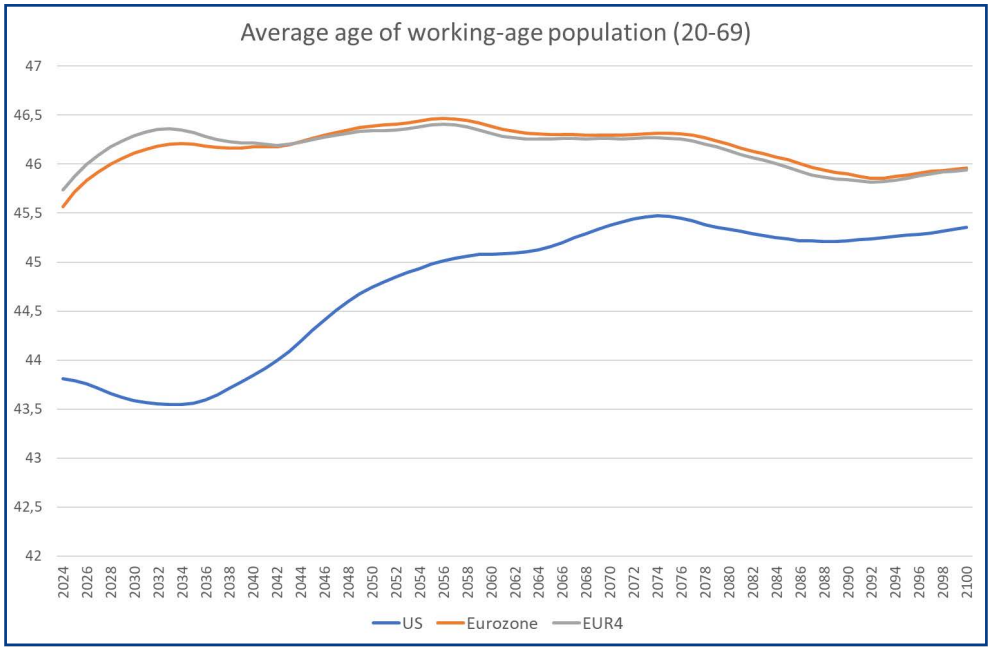


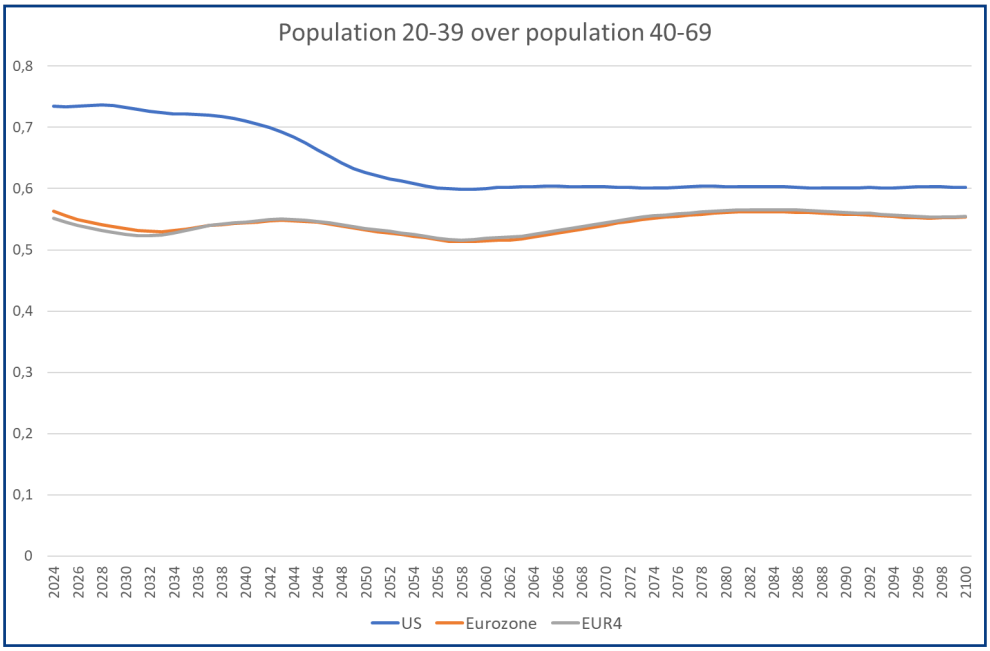


Sources: For the USA, https://www.johnfernald.net/TFP; for Eurone-4, https://www.bde.es/wbe/en/areas-actuacion/analisis-e-investigacion/recursos/europrod-ua.html

Figure 5. Forecasts of the age structure of the population, 2024-2100, Eurozone and USA.







Source: Author´s computations from data at https://population.un.org/wpp/ *. The graphs plot the data obtained in the lower 80 percentile of the prediction interval produced by UN Population Division.*