Growth, growth, growth: How and where from? Europe's demographic and technological challenges

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Abstract

Politicians often discuss economic growth but rarely provide concrete proposals to achieve it. Some countries need to kickstart growth more urgently than others, as demographic challenges pose an under-appreciated threat to long-term prosperity. In the 21st century, essential factors for growth include a multi-skilled workforce and technologies that save labour or automate jobs. For too long, traditional approaches have produced mediocre outcomes, leading European economies to stagnate. We are left with the question, how can industry, governments, and researchers work together to address a country's challenges?

JEL Classification: F43, J11, J61, O30
Keywords: Economic growth; Job Automation; Labour; Demographics

1 Introduction

"Europe is less hard-working, less ambitious, more regulated and more risk-averse than the US, with the gap between the two continents only getting wider."

Nicolai Tangen, CEO of Norges Bank Investment Management
Financial Times Interview, April 2024

Tangen's critique may be harsh but nevertheless it is a reminder of the pressing challenges of Europe's growth ambitions set out in policy papers Europe 2020 and Europe 2030 (European Commission, 2010, 2019). The basis of the policy papers is for "smart, sustainable and inclusive growth" that is a headline policy with evolving targets. This paper sets out to identify areas for the direction of research required in the areas of economic geography, and economics as whole using the timely topic of growth in light of the new European Commission, forthcoming national elections such as Germany, and recently incoming administrations.

The five headline targets from European Commission (2010) for Europe in 2020 included: (i) 75% of the population aged 20-64 should be employed (75.1% in 2023)[1]; (ii) 3% of the EU's GDP should be invested in R&D (2.25% in 2023)[2]; (iii) the 20-20-20 greenhouse gas, and energy consumption and efficiency targets[3] was not met by any country (Becker et al., 2020); (iv) the share of early school leavers should be under 10% and at least 40% of the younger generation should have a tertiary degree - in 2023 14.7% of people aged 25-34 had no or low-secondary education and 41.9% had a tertiary degree[4]; and (v) 20 million fewer people should be at risk of poverty where only 10.9 million had been lifted out of poverty by 2019[5]. Becker et al. (2020) found that not one country achieved all the targets. Europe 2020 was revised with Europe 2030 that shared the same broad targets hinting at the shortcomings.

Europe 2020 failed to deliver fully and inevitably (stimulating) growth is an increasing buzzword for politicians. Achieving growth in a sustainable, viable, and widely beneficial

[1]Source: Eurostat table lfsi_emp_a.

[2]Source: Eurostat table tsc00001. Only Sweden, Belgium, Austria, Germany, and Finland exceed R&D of 3% in 2023.

[3]The policy targets specified "A 20% reduction in EU greenhouse gas emissions from 1990 levels; Raising the share of EU energy consumption produced from renewable resources to 20%; A 20% improvement in the EU's energy efficiency.'

[4]Source: Eurostat table lfsa_pgaed.

[5]Source: Eurostat table ilc_peps01

way is challenging in many countries as there lacks sufficient research or suggestions. The desire for growth is important because many Western countries lack significant growth compared to emerging countries, and arguably a contributor to the rise of populism. Mario Draghi (2024*a*,*b*) extensively analysed and proposed policies for future European competitiveness. The report by such a prominent figure in the European Union (EU) helps to highlight the topic's importance. Draghi's analysis shows how the EU has fallen behind the United States (US) and emphasises the areas that need to be targeted: (i) closing the innovation gap with the US and China[6]; (ii) a joint plan for decarbonisation and competitiveness; and (iii) increasing security and reducing international dependencies. We can point to a series of economic and geography areas that are hindering growth where more research can help formulate policy: labour productivity, demographics (ageing workforce and low fertility rates), skills gaps, and tight labour markets.

Research into policies to encourage sustainable growth *before* announcements is important because the results can be catastrophic when policy changes are released before financial scrutinisation or if flawed entirely. Politicians make voter and business appealing policies to gain support throughout the electoral cycle, with those in power able to impose new policies as needed. Whether these policies come to fruition at all is debatable but surely a well-founded and economically sound policy should be guaranteed, right?

Well, no. For example, in September 2022, the UK's then Prime Minister Liz Truss released her new government's economic plan which featured a wave of unfunded tax cuts with the stated aim to boost economic growth. This mini-budget required the Bank of England to step in to stave off a recession.[7] Liz Truss was forced to resign within a month, yet two Prime Ministers later and the 'growth' is still a headline buzzword. Previous examples include Ronald Reagan's supply-side economics (1981-82) having caused a deep recession, high unemployment, high inflation, and increased interest rates (Sablik, 2013). François Mitterrand election in France (1981) caused a doubling in trade deficits, capital flight, inflation rate rises, interest rate hikes, and huge borrowing to prop up the exchange

[6]The US is a target than China as the Chinese economy is made up of exports to the detriment of a sustainable economy. Using the national accounts, private consumption as a percentage of GDP: Canada 57.5%(2024Q4), China 39.2% (2023), EU 52.7% (2024Q2), Japan 55.1% (2024Q3), UK 63.0% (2024Q2), US 67.8%. Source: CEIC data. Innovation is essential as China and the US are have higher number of robots per 10,000 workers and growth rates. The 2024Q3 annual growth rates: EU 1.0% and US 2.7%.

[7]Source: BBC News, Faisal Islam, "The inside story of the mini-budget disaster". First accessed 20 November 2024.

rate of the French franc (Harrison, 1984). Greece's high levels of fiscal spending and irrational pre-financial-crisis borrowing created a crisis that required massive austerity that has crippled the economy (Economides et al., 2021), which is still below its 2008 levels[8].

Currently, President elect Donald Trump repeats desired growth exceeding 3%, with his proposals for the next presidency risking hurting the global economy. Germany's annual growth for 2024 is expected to be -0.1%, though returning positive in 2025. The (political and economic) dissatisfaction in Germany is a Europe-wide issue too as Germany is the largest economy with significant spillover effects.

Providing a medium-term plan for building a sustainable growing economy is not only a numerical equation but one of great importance for researchers *and* policy makers. Bacci (2018) argued that mass migration would enable sustainable growth, however, that is not the case as migration fails to even solve the ageing problem. Migration is, at best, a part solution since migrants age, have insignificant impacts on the fertility rate, and experience labour market integration problems (Barker and Bijak, 2024; Paterno, 2011; Segendorf and Theobald, 2019). Europe has minimal labour productivity growth for nearly two decades, there are ageing populations and workforces, tight labour markets, mismatch of skills and employment requirements, underinvestment in R&D, and the robot revolution is not here yet to take our jobs to fix labour shortages. The paper identifies areas into which can highlight opportunities for policy changes to drive the stalling economic growth. This remainder of this paper is as follows: Section 2 specifies the areas of research required to formulate policies, Section 3 discusses the mismatches of Europe, and Section 4 concludes.

2 Research and Policy Needs

Each of the input factors of production need to have a definition to answer "how and where from?". Economic growth requires advancements from all factor inputs as this would give a balanced path to growth. The headline targets included environmental and energy specific policies, therefore any boosts in growth need to be environmentally conscious. For regional comparison purposes, we group the countries into Northern (Nordic

[8]Source: Eurostat table nama_10_gdp.

and Ireland), Eastern (Central and Eastern), Southern (Cyprus, Greece, Italy, Malta, Portugal, and Spain), and Western (e.g. Austria, France) as each generally group share similar characteristics.

2.1 Demography and Labour Productivity

For growth, we need a supply of labour that is increasingly productive. Ceteris paribus, a shrinking workforce and minimal increases in labour productivity limits growth. Migration has been the only source of population growth, consequently labour supply, growth which is unsustainable as migrants are a finite resource for an increasing number of countries.

Starting with a foundation of the *future available* population, Europe's differing profiles make this more than one type of problem. Two indicators that highlight demographic problems are fertility rates which are all below the replacement rate of 2.1[9] and the old age dependency ratio (OADR) which will increase significantly by 2050.[10]. Southern Europe are most concerning with highest OADRs and lowest fertility rates, while Northern and Western have more encouraging rates, and are attractive to migrants which makes a key difference between the OADR in 2050 vs Eastern Europe.

Attracting migrants is not something that policies can typically change, but in the coming years Western and Northern Europe will always have a greater economic appeal. Southern and Eastern Europe can reduce emigration by combatting the 'push factors' such as high unemployment, low wages, or lack of resources and/or services. Higher wages and better standards are living are only achievable by long-run investments but having better employment prospects is essential to retain young people. Largely, Eastern and Southern European counties have the highest unemployment rates for young people - Greece, Italy, Portugal and Spain all exceed 20%, and have higher rates for all ages.[11] The labour market problems are exacerbated as highly educated individuals emigrate resulting in increased high-skill labour shortages.

Skill mismatches are an EU wide problem, however, an additional problem for Western

[9]Source: Eurostat table demo_frate

[10]OADR is defined as the number of individuals aged 65 or older per 100 people of working age (15-64). Source: Eurostat table demo_pjanind

[11]Source: Eurostat table une_rt_m

countries such as Belgium, Germany and the Netherlands is tight labour markets resulting from skill mismatches and limited supply of additional workers. Although the EU average employment rate in 2023 is 75.1% for 20–64 year-olds the lowest is 66.3% (Italy) while the highest is 85.3% (Iceland). Northern and Western countries proportionally have higher educated individuals, with Southern countries having lower rates. Higher educated individuals have higher participation, lower unemployment (consequently higher employment) rates that partially explains the differences with the Southern countries that have relatively lower tertiary education levels and lower employment rates. Tackling low participation is essential, jobs are required for people to be employed but investment is only worthwhile if there is an available population to be reactivated. Gender disparity can be high, with different policies failing to fully close gaps. Women can become inactive if they are have caring responsibilities for children and elderly parents, and older workers retire once they have the financial resources. Finding policies to encourage employment and support workers for the groups with low participation is essential as the workforce ages and the OADR increases.

Theoretically, a lack of labour supply could utilise higher productivity to account for the shortfall, yet, that is not the case and a problem that is not on the path to being solved. Figure 1 shows the relative labour productivity for selected countries. Each European identified country is designed to represent a geographical area (Northern, Western etc.), Japan and Australia are developed non-European countries, with the aim to use the US as a benchmark. As a cross country comparison, Poland has seen the greatest increase due to its joining of the EU and growth following the collapse of the Eastern Bloc, however, the rate is beginning to slow. Most concerning is Italy which has seen close to no labour productivity growth in over 20 years. Australia and Japan highlight that this is not only a European problem rather one for non-US major developed economies.

Increasing labour productivity would help raise wages that would be a voter pleasing result, yet achieving this is complex. Problems from (lack of) labour supply or mismatches, a dwindling population and lack of labour productivity are only part of the stalling growth puzzle. Investment in the labour market through education can solve some of these issues but productivity can be aided by advancements in technologiesl.[12]

[12]For further discussions the link between productivity and living standards see Coyle and Pendrill

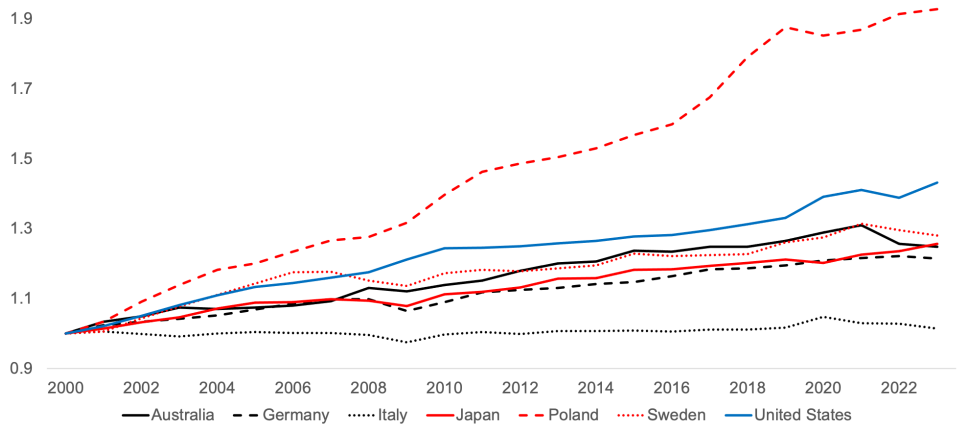


Figure 1: Labour Productivity for selected OECD countries

The figure shows GDP per hour worked identified as labour productivity relative to 2000.
Key: Australia: black solid; Germany: black dash; Italy: black dot; Japan red solid; Poland red dash; Sweden red dot, US: blue solid
Source: OECD and authors' own calculations.
Data: GDP per hour worked in US dollars per hour, PPP converted, Constant prices, 2015. Transformed to relative to 2000.

2.2 Skills and education

The skills gap and mismatches underline the need for policy changes. Europe 2020 wanted 40%+ of young people to have tertiary education by 2020 but in 2022 this large variation ranges from 19.7% (24.7%) in Romania to 52.5% (61.3%) in Ireland for 25–64 (25-34) year-olds with an EU27 average of 34.2% (41.9%) showing inequality. Figure 2a shows the distribution of tertiary educated 25–64 year-olds, with Northern and Western countries averaging higher. Discussing skill level might seem arbitrary, however, these figures have great impact on employment levels as previously discussed.

Tertiary equivalent qualification can have great value and recognition but what if the demand for those skills is not there? STEM subjects are some of the most sought after skills, yet countries often rely on an external talent supply. Figure 2b shows the rate of STEM graduates that gives an insight into the extreme skills shortages. Traditional university degrees involve classroom and lab-based learning that can leave graduates lacking real world experience for post-graduation employment. Degrees without employment experience can make a young person economically inactive. Policy changes can develop and promote tertiary or higher vocational qualifications that combine academic study with

(2023).

practical training that expands on work by Cedefop[13]. These programmes, driven by industry, can help address skill mismatches and create a supply of domestically qualified workers.

Education is not exclusive to young people. It is essential that the current workforce, including older workers, regularly up-skill. Up-skilling is policy that has been under-utilised due to inaccessibility, negative connotations, or not desired by the person. The up/re-skilling of existing workforce is a harder for middle-aged and older workers which can drive unemployment, underemployment or pushing some out of the workforce due to dissatisfaction. Programmes to pair younger inexperienced workers with older experienced but less tech savvy workers can increase knowledge sharing and a more efficient labour force.

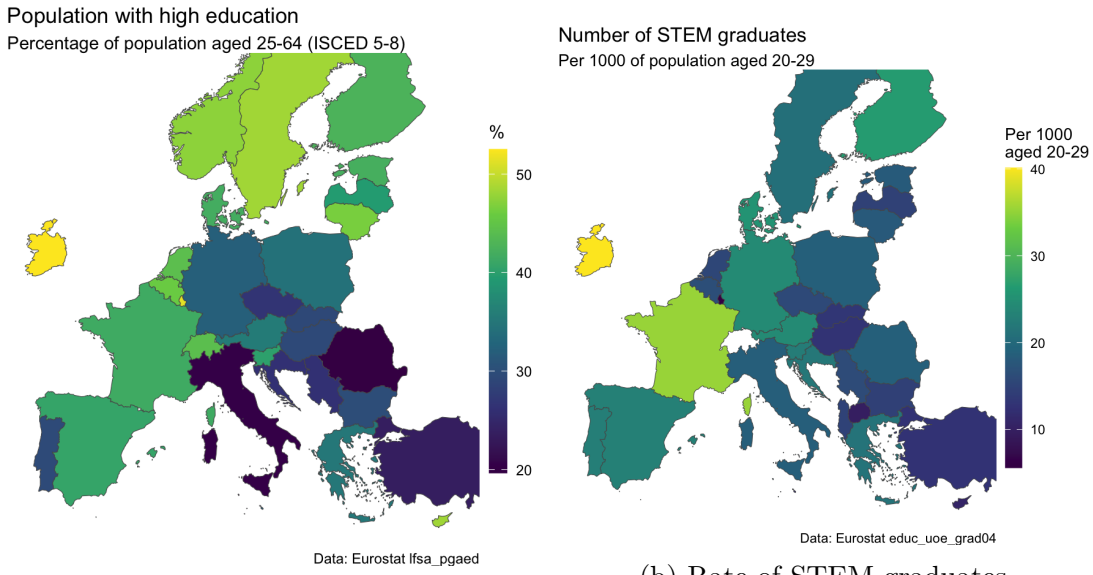
Industry specific vocational training can actually attract more people to STEM related industries. For example, high-school students interested in gaming or robotics can be attracted to this training opportunity as a foundation towards working a STEM related career in something they enjoy. High-level vocational training is not a solution for everything, but creating a generation of specialised or applied professionals is an ideal. As an added bonus, shortening the time between education completion and entering the labour force while eliminating some of the issues that traditional graduates lack in terms of experience.

Research can examine the needs of country and industry specific higher vocational qualification needs to satisfy demand by expanding Cedefop's work. Governments are more likely to finance/subsidise training programmes if the long-term contribution can be seen. Promoting these specialised qualifications, Europe can help close skills gaps by enabling students to have access to careers that traditional forms of education would prevent and thus creating an improved workforce.

2.3 The Robot Revolution

We've been told that robots or AI will take our jobs but that is not the case (Fleming, 2019). Most jobs will change because of technology rather than replaced. Providing finance for research into new labour saving technologies is one way for Europe to catch

[13] An EU agency focussed on development of vocational training.



(a) Percent of 25-64 with a tertiary degree

(b) Rate of STEM graduates

Figure 2: Tertiary education levels and STEM Graduates

The left graphic shows the percentage of the population aged 25–64 with a tertiary degree. The right graphic shows the number of STEM graduates per 1000 aged 20–29.

up to the US, in addition funding research into areas that can benefit most from the direction of research. Figure 3 shows the disparity of robots per 10,000 workers in Europe. The number of robots for countries with similar development levels can differ, which only knowledge of the domestic industries can aid explanation.

Europe's diverse industry specialities require different levels and types of robotics. There is a financing issue that industry in conjunction with governments need to resolve. We have to work with the fact that job automation, robots or AI can be partners in all parts of current output processes as well as advancing for the future. Not only are robots needing to work with engineers, but specialists from other disciplines that will help improve machines, AI, or other types of technology that makes our jobs easier. AI is only as good as the information and parameters that it is calibrated with which makes human knowledge essential.

One promising aspect of robot technologies is the possibility for low-skill workers to do medium-skill jobs, and medium-skill workers do higher-skilled jobs. However, too much or incorrect applications could have a negative effect on wages (Downey, 2021). This prospect will help countries with lower-skilled workers the chance to take advantage of this and still develop. Countries such as Portugal which have 41.7% of 25–64 year-olds

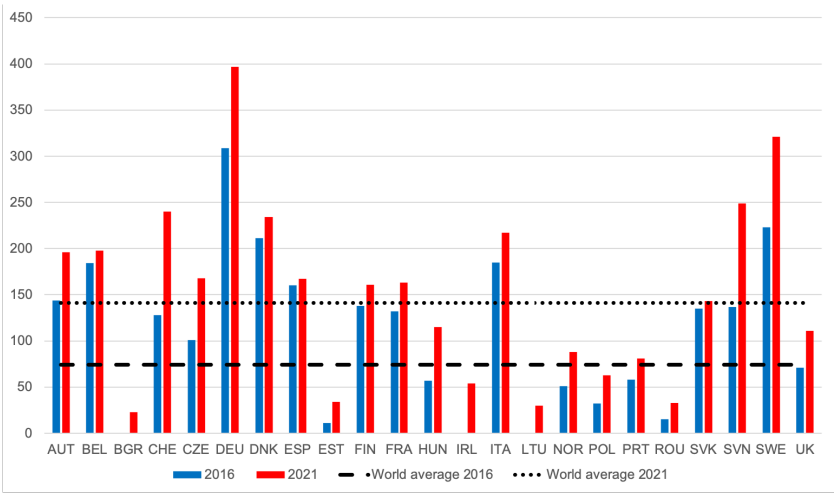


Figure 3: Robots per 10,000 workers in selected EU countries and the UK, 2016 and 2021

The blue bars give the values for 2016 (where available), with the red bars the values for 2021. The dashed and dotted horizontal lines are the global averages for these respective years. Source: International Federation of Robotics (IFR).

with none or less than upper secondary education can be one of these where low-skill workers to medium-skill tasks. The research into this will allow the targeting of robots or AI to a country basis for the country's comparative advantage in production.

2.4 (Human) Capital Flight

Europe needs to tackle the issues of why there is (human) capital flight to (mainly) the US. The prominent factors include skills shortages, financial availability and/or support, and overregulation. Europe has lost several start-ups to the US for these reasons which the size and magnitude that these companies have become is a poor reflection on Europe's business attractiveness and competitiveness. Spotify's co-founders wrote an open letter in 2016 asking the Swedish government to take action in areas including housing shortages, the limitations of the education system and (tax) laws. A lot of start-ups reason their exodus due to funding[14] but overregulation in Europe is becoming as much of a problem. This was enhanced by Meta's September 2024 letter on behalf of industry, researchers and technology leaders co-signed by companies like Ericsson and Spotify that requested regulation in AI become consistent and formed to support keeping AI development in

[14]Source: Sifted First accessed 2 December.

Europe.[15]

The decline of Europe's presence in global markets is startling. Twenty years ago, Nokia was one of the biggest mobile phone producers and European cars dominated the world market. Now, mobile phones are Apple or Android while Chinese market as brands such as BYD dominate electric vehicle sales due to their lower price and longer-range. Tariffs can offer a form of protectionism which fails to escape the fact that Europe has missed out on the mass electric car market technology with Tesla and BYD having a distinct advantage in car capability and price.

A lack of regulatory coherence exacerbates these issues. The rules differ between member states with more at EU-level which makes navigating these policies harder and creates uncertainty, whereas the US is generally unified. As Andreas Klinger (a founder of several start-ups) points out in his open letter "Dear Europe, please wake up", Europe needs to believe in itself, streamline policy, and teach English from an early age. Higher levels of English proficiency makes international co-ordination easier.[16]

2.5 AI Preparedness

Meta's letter to on Europe may well appear surprising as there are a significant number of cosignatories that are US based. However, this is failing to recognise the preparedness of EU countries for AI. The IMF's index that rates 172 countries on their preparedness for AI ranks European countries highly.[17] Denmark is only out scored by Singapore, and 7 of the top 10 are EU+ countries. The other top 10s are the US (third) and New Zealand (eighth). With the populous Germany, the Netherlands and Sweden in the top 10 this should provide a solid ground for AI to find a research hub here. Especially given the uncertain political future in the US, and the disadvantages of size and location for New Zealand and Singapore. Stanford University's AI index report has the US marginally leading Europe (and China) which serves as a reminder that continued work is required to keep up (HAI, 2024)

[15]Source: Ericsson: Open letter: Europe needs regulatory certainty on AI First accessed 25 November 2024.

[16]Andreas Klinger https://klinger.io/posts/eu-acc First accessed 3 December 2024.

[17]Source: IMF AI Preparedness Index First accessed 25 November 2024.

3 Europe: A skill and technological mismatch

Europe's diversity presents challenges and opportunities. Barker and Bijak (2024) details the differences and builds further on the data to underpin the problems faced. Southern Europe, heavily affected by the financial crisis, suffers from underinvestment, brain drain, and poor demographic prospects. Greece and Italy have the EU's lowest employment rates (67.4% and 66.3%, respectively), driven partly by large gender gaps (19.8% and 19.5%). Similarly, Eastern Europe faces significant emigration of skilled graduates, including STEM professionals, due to limited local demand and pull factors. Eastern countries including Czechia, Slovakia, and Slovenia are aligning more closely with Western Europe, though the Eastern broader region still contends with high emigration and skill mismatches.

Northern and Western Europe remain economic powerhouses supported by favourable demographics, though stagnating labour productivity. Policies to boost productivity and reactivate underutilised labour—especially through education and demographic investment—are essential. Robots, job automation and AI offer partial solutions but require significant adaptation in low-automation regions. Robots and machines range from heavy manufacturing to fruit-picking. Countries that have high levels of agriculture benefit from fruit-picking machines, these are labour saving and relieve labour market shortages. These machines can also be used in Northern and Western Europe where there are chronic labour shortages in these industries, even though robots here are stereotypical manufacturing related and capital intensive.

Key industries also face pressures: Germany and Sweden's advanced manufacturing sectors maintain strong automation levels, but Italy's packaging industry and Slovakia's automotive sector are vulnerable to industry slowdowns. Education improvements under Europe 2020 have yet to align fully with job market demands. Free movement of labour optimises skills across the EU but exacerbates brain drain in migrant-sending countries, while free capital movement facilitates investment at the cost of exploiting cheaper labour in lower-wage economies.

Private *and* public sector financing is required. Governments are nervous about borrowing to stimulate the economy as too high debt levels are believed to stagnate growth,

as in the case for Greece. This was populated by the paper Reinhart and Rogoff (2010), however, errors were highlighted by Herndon et al. (2014). Reinhart and Rogoff (2010) was a timely paper quoted by policy makers for years that indicated a debt-to-GDP 'limit' of 90%. The stagnation was overestimated, with an average real GDP growth rate for countries with a public-debt-to-GDP ratio of 90%+ to be 2.2%, rather -0.1% as in Reinhart and Rogoff (2010). Growth, albeit lower in terms of historical levels, has a vastly different policy deduction than economic contraction. Bell et al. (2015) use multilevel modelling to show the average effect on growth is minimal and the countries with high debt ratios are more volatile, further arguing that the original paper is too simplistic. Consequently, the perceived apprehension of governments towards borrowing is not as founded as originally thought which makes further financing viable. Nonetheless, the only EU27 countries to have government debt to GDP ratios in excess of 90% in 2024 are Greece, Italy, France, Belgium, Spain and Portugal with the EU average is 81.5%.[18]

4 A vision for a Sovereign and Prosperous Europe

This paper provokes a new discussion and outlined research areas for foundations to build a better and more successful Europe. Ultimately, Europe 2020 only partially achieved smart, sustainable and inclusive growth. Growth has near flatlined leaving Europe increasingly far behind the US. Europe's strength lies in diverse specialisations within one trading bloc. Free movement of people, goods, services and capital creates a collective with the breadth of knowledge and resources within an economy that is hard to rival. The EU, as a bloc, could revisit comparative advantage theory. The best way to increase security and reduce dependencies (de- or uncoupling) is to specialise markets per country for a combined more productive Europe. The EU has a unique position in that a collective government can take a long-term view rather than national governments who are accused of a short-term focus for political gain.

There is no consensus or joint effort to have a steadfast battle-ready plan, as highlighted in open letters from industry leaders. Solving the growth problem requires a multidisciplinary approach. Demographers, geographers, political studies, economics, computer science, engineers, and many others need to collaborate to develop strategies

[18]Source: Eurostat table gov_10q_ggdebt.

that combine research and industry with policymaking. Once there is a foundation of research to which policy can be formed, the industry input can make country specific policies to prevent an exodus of human and financial capital which helps close the gap to the US.

Europe needs a coordinated policy approach that research can provide foundations. Europe has to overcome the challenges of an ageing workforce, something that industry input can really get governments to react. Country specific policies are required because, e.g. Norway's experience with an oil dominated economy is no help to Bulgaria's agriculture driven economy or Italy's packaging with Slovakia's cars etc. With the right policies and strategies, we can get young and old workers collaborating to bring their knowledge and experience together. Reactivating and up-skilling the existing workforce, offering targeted education programs and promoting intergenerational collaboration can provide an inclusive form of growth. Training programmes can share international expertise to make Europe a talent hub.

Reducing dependencies, for example on Russian energy that left Europe exposed, is critical. Europe being entirely self-sufficient is impossible as there are non-European comparative advantages that make changing this financially unviable. A shift to a greener and more sustainable fuels can help self-sufficiency. Using energy efficient storage systems (such as Finnish start-up Polar Night Energy's sand-based storage system) will give a path to sustainability and security.

A coordinated approach maximising national strengths is essential to regain standings in research, be attractive to talent, and be an innovator. Europe could leverage the anti-immigration rhetoric in the US to position itself as an AI hub, similar to Canada's "Silicon Valley North". This is not just about bringing in increasingly more migrants, but creating (financial) resources and policy framework to support making Europe attractive again.

References

Bacci, M. L. (2018), 'Does Europe need mass immigration?', *Journal of Economic Geography* **18**(4), 695–703.

Barker, E. R. and Bijak, J. (2024), Europe's challenges of population ageing:

Are migration and automation possible solutions?, FutuRes Project Deliverable D4.2, University of Southampton, Southampton.

Becker, W., Norlén, H., Dijkstra, L. and Athanasoglou, S. (2020), 'Wrapping up the Europe 2020 strategy: A multidimensional indicator analysis', *Environmental and Sustainability Indicators* **8**, 100075.

Bell, A., Johnston, R. and Jones, K. (2015), 'Stylised fact or situated messiness? The diverse effects of increasing debt on national economic growth', *Journal of Economic Geography* **15**(2), 449–472.

Coyle, D. and Pendrill, J. (2023), *The Productivity Agenda*, The Productivity Institute. Available at https://www.productivity.ac.uk/wp-content/uploads/2023/11/TPI-Agenda-for-Productivity-2023-DIGITAL-VERSION.pdf. First Accessed 18 December 2024.

Downey, M. (2021), 'Partial automation and the technology-enabled deskilling of routine jobs', *Labour Economics* **69**, 101973.

Draghi, M. (2024*a*), The future of European competitiveness – A competitiveness strategy for Europe, Institutional paper, European Commission. Available at https://commission.europa.eu/topics/strengthening-european-competitiveness/eu-competitiveness-looking-ahead_en.

Draghi, M. (2024*b*), The future of European competitiveness – In-depth analysis and recommendations, Institutional paper, European Commission. Available at https://commission.europa.eu/topics/strengthening-european-competitiveness/eu-competitiveness-looking-ahead_en.

Economides, G., Papageorgiou, D. and Philippopoulos, A. (2021), 'Austerity, Assistance and Institutions: Lessons from the Greek Sovereign Debt Crisis', *Open Economies Review* **32**(3), 435–478.

European Commission (2010), *Europe 2020: A strategy for smart, sustainable and inclusive growth: Communication from the commission*, Publications Office of the European Union.

European Commission (2019), *Reflection paper: Towards a Sustainable Europe by 2030*, Publications Office of the European Union.

Fleming, P. (2019), 'Robots and organization studies: Why robots might not want to steal your job', *Organization Studies* **40**(1), 23–38.

HAI, S. (2024), *The AI Index Report: Measuring trends in AI*, Stanford Institute for Human-Centered Artificial Intelligence, Stanford University. Available at https://aiindex.stanford.edu/report/. First Accessed 18 December 2024.

Harrison, M. M. (1984), 'France under the Socialists', *Current History* **83**, 153–156, 181.

Herndon, T., Ash, M. and Pollin, R. (2014), 'Does high public debt consistently stifle economic growth? A critique of Reinhart and Rogoff', *Cambridge Journal of Economics* **38**(2), 257–279.

Paterno, A. (2011), 'Is immigration the solution to population aging?', *Genus* **67**(3), 65–82.

Reinhart, C. M. and Rogoff, K. S. (2010), 'Growth in a Time of Debt', *American Economic Review* **100**(2), 573–578.

Sablik, T. (2013), Recession of 1981-82, Federal Reserve History, Federal Reserve Bank of Richmond.

Segendorf, A. and Theobald, E. (2019), 'Can immigration solve the problem of an aging population', *Sveriges Riksbank Economic Review* **1**, 6–29.