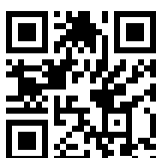


Letting large European firms grow



EGOV
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External author:
Ricardo REIS



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Abstract

The EU has grown less, and has become less productive, than the US in the last twenty years. The differences are small, but a healthy ambition to do better justifies analysing the sources of this difference and how policy can affect them. This paper focuses on the pattern of specialisation of the EU economy and discusses the role of large firms in generating innovation. It documents the large US-EU gap in the ability to scale large firms and grow them into world leaders, and discusses the reasons that can be behind it, as well as what policies may change this. Focussing on industrial policy, it discusses its potential together with several reasons to be sceptical that the potential could be realised. It concludes that promoting more movement and better allocation of capital and labour within the EU are general priorities.

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AUTHORS

Ricardo REIS, London School of Economics and Political Science

ADMINISTRATOR RESPONSIBLE

Giacomo LOI
Maja SABOL

EDITORIAL ASSISTANT

Donella BOLDI

LINGUISTIC VERSIONS

Original: EN

ABOUT THE EDITOR

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To contact Economic Governance and EMU Scrutiny Unit or to subscribe to its newsletter please write to:

Economic Governance and EMU Scrutiny Unit
European Parliament
B-1047 Brussels
E-mail: egov@ep.europa.eu

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EXECUTIVE SUMMARY

- GDP growth and productivity growth have been lower in the EU than in the US, and this difference widened since the COVID-19 pandemic. However, these differences are small quantitatively. There are good reasons to be ambitious in identifying the causes for these differences, and in working to improve the EU's economic performance, but one should be wary of radical reforms inspired by an unplaced pessimist outlook.
- The first source of the growth slowdown in EU is the ageing of the population together with fewer hours worked. Some of it reflects preferences, some reflects constraints and policies. Much work has been done to understand it already.
- A better allocation of capital across European regions, and especially more investment in the European periphery, would likely boost economic performance. However, achieving this improvement in allocation is difficult. The barriers to it, as well as the solutions, have been well diagnosed and studied already.
- Decompositions of productivity growth reveal a pattern of specialisation in innovation. US firms specialise in technologies that use information and communication technologies (ICT) more intensively and that innovate in new products. The EU specialises in technologies that use non-ICT forms of capital more intensively and that innovate in perfecting the quality of products.
- The power of comparative advantage means that, with this specialisation, even if the EU is not at the technology frontier, it will grow as fast as the US. Crucial for this economic model is that the EU continues to have integrated and free trade with the US and the rest of the world, so that it can import the new products, actively improve them, and export.
- Much innovation is done by larger firms. Looking at all sectors, or at the subset of technology firms, the EU has a large gap relative to the US in the number of large firms, or in their relative size and value.
- The EU has mostly caught up to the US in the creation of new firms, including in start-ups, as well as in their first rounds of venture capital funding. Therefore, the absence of large firms arises from either EU firms moving abroad as they grow, or being trapped in a size that is large but not world leading, for some reason unable or unwilling to grow further.
- Among the largest companies, there is a striking discrepancy between how many EU firms move to the US versus how few US firms move to the EU. The gap is even wider when one considers the large share of unicorns that were founded by EU nationals, but which today operate in the US.
- The data suggests that, in relative terms, the US offers opportunities for large firms to scale quickly and become world leaders. Firms that move then grow quickly in the months after their moves. It is important to understand what is behind this difference in scaling possibilities between the US and the EU.
- One hypothesis is that the US offers a larger domestic market for sales, which the EU still does not offer, in spite of all the progress in creating a single market. The data suggests this is not a major factor, since we observe similar scaling rates for US firms across states, and since growing firms in the technology sector do so by selling to many markets across borders.
- Another hypothesis is that the US offers a deeper pocket of skilled workers needed for scaling. If so, the major difference between the US and the EU may be the relative mobility of skilled workers, and the US's superior ability to attract skilled immigrants.

- A third hypothesis is that the US has better management skills that somehow do not transmit through education and other formal channels. Perhaps the source of the difference are laws and regulations in managing the workforce that are especially distorting for firms growing very quickly.
- The most common hypothesis is that the US offers deeper capital markets, not so much for initial start-up capital but for large posterior scaling. Perhaps the source is a better corporate governance environment.
- Insofar as many EU countries have implicit subsidies to small and medium firms, these are taxes on large firms. Industrial policy may be able to attenuate these relative incentives.
- In the data, there is a strong scale bias of industrial policy, with larger firms receiving a disproportionate share of funds. Potentially, industrial policy could be used to support the scaling up of European firms.
- There are many reasons to be sceptical of the effectiveness of a specific industrial policy. First, the relaxation of state aid rules in 2021-22 does not seem to have led to any observable change in the US-EU gap or in the factor driving it. Second, the risk of picking winners is great. Third, the fact that industrial policy is national within the EU raises a serious risk of a race to the top in terms of support that is wasteful and highly distortionary of the single market. Perhaps more importantly, there is still no strong case for industrial policy to solve the root problem of scaling up.
- Ultimately, the obstacles to scaling are barriers to allocating capital and labour to these promising firms that can be fought with policies that integrate EU markets and free trade, promote capital and labour mobility, and remove distortions to their allocation.

1. INTRODUCTION

The European Union (EU) is going through an economic identity crisis. Since the turn of the century, GDP growth in Europe has been slightly below that of the United States (US), and significantly below that of China. Since the world's Great Financial Crisis and the European sovereign debt crisis, the gap in growth rates between the US and the EU widened. Finally, and more relevant to the current concerns, the euro area (EA) economy grew by five percentage points less than the US economy between the end of 2019 and 2023 (ECB, 2024). Forecasts from the International Monetary Fund (IMF) are likewise dismal for Europe and rosier for the US.

While qualitatively, the previous paragraph is correct, the differences it describes relative to the US are slight. Depending on which measure of income is used, which exchange rate is used, what countries to include form the EU's changing composition, and on whether one divides GDP by total population or by working-age population, then one can get a significant gap between US and EU, or a quite small one. As for the closing of the income gap between the EU and China, it was to be expected, given the fast (and desirable) convergence process of a very poor nation. Per capita income in China is still very far from the level of income in an average country in the EU.

A quantitatively accurate reading of the data is that the EU has grown slightly less than the US in the last decade, and that the gap seems to have gotten slightly larger in the last few years: between 2012 and 2022, using gross domestic product per capita in purchasing power units and EU-27, then the US grew at 1.67% per year, while the EU at 1.43% per year. This is not a reason to panic or to try to completely revamp the European economic model, which has delivered prosperity for many decades. It is instead a source for some reflections, insofar as Europeans should strive to be at least as well off as Americans, and we would like to understand even small differences in the evolution of the two economies.

This paper offers some discussion of what is behind this gap, with a focus on the difficulties that European firms at the technological frontier have in growing. The next section goes through some of the immediate causes of the gap between the EU and the US. Section 3 focuses on the inability of large EU firms to grow and become world leaders, while section 4 discusses to what extent industrial policy may help unleash this process. Section 5 concludes.

2. THE IMMEDIATE FACTORS BEHIND THE US-EU GAP

2.1. Sources of the growth slowdown in Europe

The European population is ageing. While the size of the workforce continues to expand, its average age is significantly higher. In a near future that labour force will shrink, similar to what has happened in Japan already. Inevitably, this creates a drag on growth per capita (Fernandez-Villaverde, Ventura, and Yao, 2023).

Furthermore, hours worked per person and labour force participation are lower in the EU than in the US.¹ One relatively straightforward way to catch up in income levels to the US would be to get more Europeans to work for longer hours. Some of the gap in hours worked arises from higher and more progressive taxes on labour income in Europe. This topic has been discussed for a long time (Rogerson, 2024), and some European countries have, over the last few decades, either removed some of the more extreme tax-benefit disadvantages to working or introduced explicit subsidies to work. While surely there is more that could be done in this regard, to some extent Europeans have also expressed a preference for working fewer hours, making it less clear that an increase in income via this route would raise welfare (Jones and Klenow, 2016).

The EU could also accumulate more capital by investing more. The ratio of capital to output is arguably slightly below its US counterpart, although there is plenty of imprecision in measuring the size of the capital stock (Reis, 2022). Since there is still a greater discrepancy in capital-output ratios across countries within the EU, any improvement would likely come from investment in the European periphery, where the capital stock is lower.

This is not a novel point. It has been part of European discussions for many decades, and motivated discussions of a capital union. With significant savings in the European core, partly as a result of the demographic evolution, a flow of capital into investment in the European periphery could and should improve average living standards for all. Yet, this promise has not been realised. The flow of capital from the core to the periphery has to be allocated to the most efficient uses, and the data from the 2000-08 suggests that it did not (Reis, 2013). This misallocation of capital is partly due to deficiencies in capital markets in many of the periphery countries. There is room for improvement, but there has been an enormous amount of research on this topic over the last twenty (or more years) without compelling evidence that the changes that are feasible would have a large impact on economic growth.

If not labour, nor capital, then the third factor behind growth is the improvement in productivity. Focussing again on the US-EU comparisons, in terms of growth rates, this is the largest component. Capital and labour differences account for a significant amount of the difference in levels, but when it comes to the growth rates and the emerging gap between US and EU, productivity seems to be the dominant force.

2.2. Two factors in productivity growth

There are many ways to decompose the growth rate of productivity into separate components. Two of them are particularly striking and informative about the US-EU differential.

The first one uses the concept of the world technology frontier (Caselli and Coleman, 2005) as it pertains to the adoption of information and communication technologies (ICT). Much of the productivity gap

¹ For instance, the ratio of employment to population is 44% in Italy, 52% in Portugal, and 59% in Germany, but it is 90% in the US. Americans work on average 1825 hours per year, while Portuguese do 1736, Italians 1718, and Germans 1388 (Rogerson, 2024).

between the two regions can be attributed to ICT capital, which seems to be more productive in the US than in the EU (Schivardi and Schmitz, 2020). US investment in ICT has been higher since the mid-1990s and it has been associated with improvements in productivity relative to the EU, especially in the services sector. Investment in ICTs and their use seem to be marked by higher fixed costs and lower marginal costs. This technology is therefore biased towards larger firms, operating at a larger scale of production (Reichardt, 2023). It has been well documented that firms in Europe are, all else equal, smaller than in the US, therefore reflecting a disadvantage in adopting ICT and boosting productivity (Poschke, 2018).

Another striking decomposition of productivity where the US and EU look quite different was done by Hsieh, Klenow, and Shmizu (2022). It focuses on the importance of new product creation versus importing those products from abroad and catching up to their quality. Their insight is to combine the innovation data in each country with data on a country's exports. If a country innovates mostly by creating new products, then we should expect it to export these, while countries that instead adopt these new products and specialise in improving their quality will tend to export products that are more mature in their life cycle. Their striking result is that 87% of US exports involve creation of new products, while for other rich countries (a group dominated by European countries), that share is 22%. Europe does not innovate much in terms of generating new products, but it does innovate in perfecting them and improving their quality. Moreover, in their estimates, innovation in Europe accounts only for approximately one third of its productivity growth, with the other two thirds arising from imported goods (the bulk of which come from the US).

2.3. A mercantilist warning sign: comparative advantage and catching up

Consider the following interpretation of the facts above: Europe is beyond the technology frontier when it comes to the use of ICTs. This is associated with the US innovating in terms of new products, which the EU then imports. This may appear to be a world in which the EU is inevitably behind the US. Yet, this does not imply that the gap between the two would rise. Rather, these two facts also suggest that the EU would, by the principles of comparative advantage, specialise in products that are relatively less ICT intensive, as is true in the data. It would also suggest that the EU would focus on quality improvements of initial varieties and would use its imports of US goods in that process. This is also consistent with the data.

While EU economies can specialise in some sectors and in quality improvements to existing goods, then this should not undermine EU growth. The EU may well be very close to the technology frontier and grow just as fast as the US while following this economic model. Arguably, this has been the position in which the EU has been for 20 or 30 years. As stated in the introduction, while the economic performance has been somewhat dismal, quantitatively it has only been slightly below that of the US. One may well have to settle for this.

Trying to deny this pattern of specialisation, or actively fight it with policies, may very well lead to worst outcomes, as often happens when the mercantilist pursuit of absolute advantage clashes with the Ricardian forces of comparative advantage. A desirable strategy for the EU would be to fight for open borders to trade with the US, and for a stable international trading system where these patterns of specialisation can be realised. Avoiding geopolitical uncertainty, or a repeat of global trade wars, would be the priority for our foreign policy. The reason for the current anxiety about the economy would be justified by the retreat from globalisation.

There are three arguments to go beyond this conclusion. The first is simple, but also powerful: ambition. It is legitimate to aim for more than to follow to the US economy, focussed on always keeping close but with little hope of fully catching up, let alone overtaking.

The second reason is the rise in artificial intelligence. While we are still at the infancy of this new technology, existing signs show it to be like ICT in its use of other factors and in its emphasis on economies of scale. If so, then this would increase the gap between the US and Europe as the world transitions to this new technology.

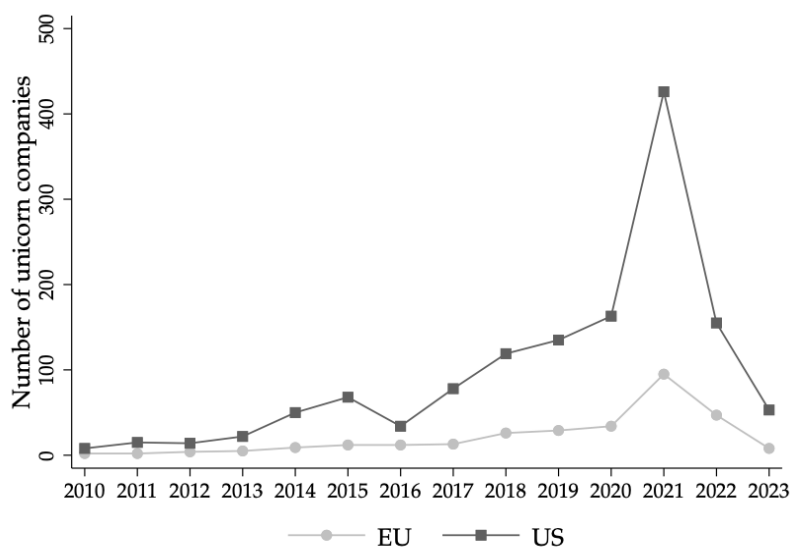
The third is that even if the pattern of comparative advantage above is an equilibrium, this does not mean that different policies and institutions cannot bring about different equilibria. Considering these is important before settling for the inevitability of the status quo.

2.4. Europe and the leadership in new technologies

How can Europe become a product innovator and reach (and push) the technology frontier? Simple decompositions of innovation show that much of this innovation is done by larger firms (Garcia-Masia, Hsieh, and Klenow, 2019), even if its spillovers to other firms is as important as a driver of overall final growth (Akcigit and Ates, 2021).² Focussing solely on these drivers, an often-stated source of anxiety among European leaders is the lack of industrial leaders in the EU.

Figure 1 starts with the set of current of unicorn companies — technology companies in the ICT sector that are worth more than one billion US dollars — and divides them according to their current headquarters' location. The dominance of the US as a location for these innovators is clear. If anything, it has been growing over the last ten years. Figure 2 shows a similar exercise that, instead of counting firms, weights them by their market valuation. The gap is even higher, as not only the US has more unicorns, but it also has the higher-value firms within that group.

Figure 1: The headquarters of unicorn companies: count



Source: Reichardt and Reis (2024a)

² To help fix ideas, in this paper, larger firms are those with more than 250 employees and more than 50 million euros in annual turnover. The definition varies across sources and works cited.

Outside of technology, looking at the largest twenty companies in the world by total revenue, only Volkswagen is based in Europe. Looking instead at the largest firms by market capitalisation at the end of 2023, then Novo Nordic and ASML are the only two European firms.

Figure 2: The headquarters of unicorn companies: market value



Source: The Economist magazine (2024a)

2.5. Dynamism and start-ups do not seem to be the sole answer

It is natural to infer from figures and statistics like those mentioned above (of which there are dozens of variants in the media and in multiple policy reports) that Europe lacks the business dynamism to create such innovative firms. Indeed, in the EU in 2021, approximately 3.4 million enterprises were created; the corresponding US number was 5.1 million.³

However, these numbers are distorted by the fact that during the COVID-19 pandemic, many firms were destroyed in the US, and new ones created right after, often as renewed versions of their old setup. In the EU, instead, there was strong support of existing firms through the pandemic. How much of a material difference this makes is still being studied, but these different approaches towards the pandemic lockdown lead to an overstatement of business dynamics in the US relative to Europe in recent years.

Looking instead at the average creation of businesses in the 5 years before the COVID-19 pandemic, the average in the United States was 3.2 million enterprises. The 2014-2019 average for the EU is only slightly below, and in 2019, the number is quite similar.⁴ By 2019, business creation in the EU had almost caught up with the US. Creating new businesses does not seem to be the major distinction between the EU and the US.

³ Own calculations from Eurostat, Business Demography Statistics, and Census Bureau, Business Formation Statistics.

⁴ Same source as footnote 3.

Turning more specifically to startups in the technology sector, Europe clearly lagged during the early years of the Internet. However, gradually but persistently, the gap with the US in this domain has been closing. The more recent data also points to Europe catching up in terms of the number of startups and the venture capital it attracts (Economist, 2023). While there is still room for improvement, there has been policy work on this area, and much progress as well.

How can the EU be creating technologically innovative companies at a pace that is not too different from the US, and yet then end up with much fewer technological leaders? The next two sections explore two natural explanations: first that these EU start-ups move to the US as they become leaders, and second that they stall in their growth or exit before they become leaders.

3. SCALING EXISTING FIRMS

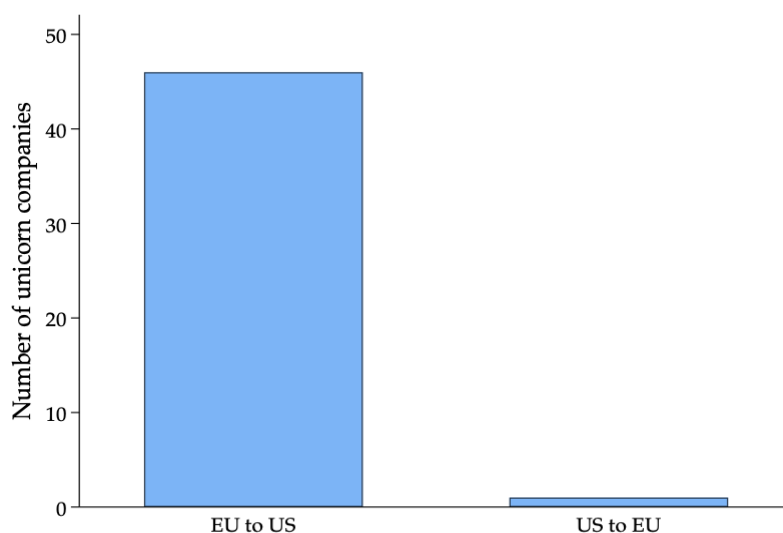
Most companies keep their headquarters in the same country where they were founded. Even as businesses grow, enter foreign markets, and become multinationals, there is a very strong “birth bias” to remain within their original country.

While this bias is also present for companies at the technology frontier, it is significantly less visible among technology firms. Partly this may be because it is common for companies in this sector to be acquired and integrated into the operations of the acquirer, partly it may be because these companies grow quickly and have weaker roots to their birthplace. Whichever is the reason, it is significantly more common to find leading technology companies whose headquarters is not in the same place as where they were founded.

3.1. The movement of firms across the Atlantic

Figure 3 shows a simple statistic from the more thorough work in Reichardt and Reis (2024a). Start with a list of unicorn companies in the technology sector today. Record their location, and measure where they were located when they were first founded. Then count how many were created in the EU, and then moved to the US, as well as in the other direction.

Figure 3: Number of current unicorn companies that moved between US and EU



Source: Reichardt and Reis (2024a)

Even though the EU created about one third of the future unicorns relative to the US, it is responsible for twenty times more movers than the US. The rate of movement is therefore approximately 120 times larger in the EU than in the US, an astounding difference. Reichardt and Reis (2024a) show that this does not apply solely to the technological sector. Starting from the Fortune 1000 companies in the US, and building their equivalent in Europe, they measure how many of them were started elsewhere. The discrepancy is not as large as in the technology sector, because there are fewer movers overall. However, the rate of exit in Europe is still one order of magnitude larger than in the US. That is, while it is rare to have a large company in Europe that was founded elsewhere, there are a few US firms that were founded elsewhere, and many of those were founded in Europe.

Expanding this analysis to include the nationality of the founders, the numbers become more striking. Many of the largest US firms were founded by non-Americans (whether living in the US or elsewhere), whereas these are very rare in the EU. The data supports the view that the US-EU gap is not so much in creating ideas nor in generating entrepreneurs with high human capital. Rather the difference is that those entrepreneurs and companies leave the EU and move to the US at a much higher rate than the other way around.

3.2. Attraction, not repulsion

Digging deeper, we can consider in which state were currently large US firms founded. The rate at which they move to the three states with the most leading firms is higher, but not much higher, than the rate at which they move from Europe. An alternative way to say this is that in statistical analyses determining where companies move, the key determinant is where they move to, more than where they move from.

This suggests that the underlying reason for this movement of firms is to be found in the characteristics of the destination regions rather than those of the source region. That is, it suggests that the European firms that move are not motivated by leaving Europe, but rather by re-locating to one of a handful of states in the US. Looking for explanations for this move, it is more likely to have to do with what the US offers than to EU policies that purposely repel these firms. Of course, in relative terms, what matters is that one place is more attractive than the other, and that the difference is large enough to offset the large costs of moving.

In turn, looking at two companies in the same industry, it is still the case that the European one is significantly more likely to move to the US than the other way around. At the same time, the difference is significantly larger in some sectors with technology at the front. Therefore, industry explains some of the relative differential, but not all of it.

Finally, looking at what happens in the months after a company moves reveals that it goes through a period of fast growth in sales, employment, and capital investment. Likewise, just before moving, companies were growing. It is difficult to find country characteristics of the source country that statistically significantly explain a move. Firms that move do not do so to avoid extinction, or after a bad shock. Rather, they move to start a new cycle of growth and expansion.

Why is the US so attractive to large growing firms? Can we replicate such success in Europe? There are several hypotheses that can explain it, each suggesting different policies.

3.3. First hypothesis: size of customer market

If firms move to grow, then this suggests that the answer for the US-EU movement may be the presence of increasing returns to scale. Since at least Alfred Marshall, economists have argued that reaching more customers is an important source of increasing returns.

The EU's consumer market is roughly as large as the US. However, the single market is not fully accomplished yet, and there are still national regulations that segment national markets, especially in many services sectors. Arguably, a company from a small European market that is looking for a large burst of expansion in the number of its clients may find that this is easier to do in the US. The alternative in order to stay in the EU may be instead to move sequentially into each separate European market, incurring growing costs of complying with the regulation in that market.

There are two counter arguments to this being the most important factor, or at least the only one. First, we see large US firms moving from one state to another when they are about to go through an expansion burst. The presence of a US national market does not seem to remove the desire to relocate.

Second, the movement of firms before expansions happens especially in the ICT sector. Looking at the markets where these companies expand, the US is not disproportionately large. The firms that move in the ICT industry grow quickly across many markets all over the world once they move. They do not move to the US just to take advantage of its US domestic market, but to expand across many world markets.

3.4. Second hypothesis: availability of skilled workers

Perhaps firms move because they realise that an expansion requires hiring a large number of workers, which their current labour market does not supply. Concretely, in the case of ICTs, perhaps the domestic labour market provided enough skilled workers for the first expansion stages of a company, but once a new wave of hundreds of workers needs to be hired, the firm needs to move to find them. The US may be attractive because it has many such professionals available.

Looking at the human capital stock in Europe, measured by people with college degrees or even by degrees in STEM, there is still some gap to the United States, despite much progress over the last thirty years. The mobility of people within the EU may act more as a constraint in the ability of firms to concentrate many workers with specific skills in one place, at least relative to the US. Where the EU falls behind the US the most is in the ability to attract high-skilled immigrants.

3.5. Third hypothesis: management skills

Bloom, Sadun and Van Reenen (2012) found that US multinationals were more productive in using ICT, regardless of whether they were in the US or in the EU. They argued that management practices explained the difference, especially in the way in which US firms managed their workforce and linked individual performance to promotions, rewards, hiring and firing.

One would expect this to be especially relevant for a firm that is growing quickly. Managing a workforce that expands at a fast pace requires adjusting management practices and setting up an efficient management of human resources. More broadly, there are many management challenges in a quickly expanding firm that is growing from being large to being very large: marketing, sales across different markets, adjusting the product to tastes of different customers without losing efficiency, etc. Perhaps US firms are better at it.

A difficulty with this explanation is that it is hard to see what the large barriers to the transmission of management knowledge between the US and the EU are. There are business schools in the EU and degrees in management that teach approximately the same content as their US counterparts. Explanations based on culture are, as usual, unsatisfactory, especially as one observes such large differences across different countries within the EU. It is more promising to look at what regulations and laws constrain management of very large firms in the EU disproportionately relative to the US.

3.6. Fourth hypothesis: capital markets

When a large firm wants to quickly grow, it almost always needs outside capital. Perhaps the movement of firms from the EU to the US is in search of capital. The data supports this hypothesis: when looking at the time at which firms move, often (but far from always) this comes associated with either listing its shares publicly, or with a new round of venture capital that is much larger than previous ones (Reichardt and Reis, 2024a).

For many years, EU institutions have been trying to advance the capital market union, hoping to create a large and liquid capital market in the continent. Much has been written about what the barriers to achieving this are, and how to go about removing them. Focusing on the scaling problem of EU firms points in two new directions that have not been as visible in these debates.

First, some of the focus has been on the initial rounds of venture capital funding and on the start-up environment. Yet, the data suggests that the US-EU gap is especially large at the later rounds of venture capital funding, or even at the stage of going public (Reichardt and Reis, 2024a). It is in mobilising large amounts of capital that the US capital markets seem to have an edge.

Second, capital for fast scaling is likely associated with principal-agent problems. Especially in technology companies, where the founder plays a large role, a difficulty with raising external capital is whether the funders can exert some control over the management. Perhaps the US has better governance structures that allow for this to happen, and therefore is more attractive for outside investors. In other words, perhaps it is not the capital per se that firms obtain in the US, but rather a legal framework that ensures good governance and gives the power to the outside investors that they require to invest in the first place.

4. INDUSTRIAL POLICY

Many countries in the EU actively promote and subsidise small and medium firms. SMEs are seen as creating many jobs, providing a vehicle for entrepreneurship and social mobility, and enhancing dynamism in economic activity. Beyond active regulation or tax incentives, sometimes it is banks themselves that favour small firms because lending to them allows them to diversify risk, especially in the countries in the European periphery. Even when funds were abundant through capital flow from the core countries during 2000-08, often this capital was misallocated across sectors and companies in the periphery, partly because it did not make its way to the larger exporting firms (Brunnermeier and Reis, 2023).

It is inevitable that, in relative terms, a subsidy to a small firm is a tax on larger firms. This will discourage the relative incentives to scale up firms. Moreover, when it comes to large firms that are trying to become worldwide leaders, the elasticity of moving may be higher. Therefore, the relative taxation on scale may have a larger effect at this scaling phase of the business and lead them to move abroad. These discouraging effects of incentives may deter many firms from scaling in the first place, leading potentially to there being many EU firms with a potential to grow that is kept unrealised.

4.1. Industrial policy to aid scaling

Many industrial policies under-deliver in their goals. Once one considers the fiscal cost of the measures, together with the opportunity cost in redeploying resources elsewhere, often industrial policies hurt growth more than they promote it. At the same time, some industrial policies have had positive effects on employment, productivity, and growth, and there is active research understanding what

characteristics explain the success cases (Juhász, Lane, Rodrik 2024). That is not the topic of this paper, but instead the focus here is on whether industrial policies can give a valuable contribution to let large EU firms scale up to become world leaders.

In theory, this could be the case through several channels. First, industrial policy can translate into an incentive for firms to grow to qualify for this support. This may then serve to offset the relative subsidy to smaller firms discussed above.

Second, qualifying for state aid often requires practices of accountability, transparency and governance within the firm. The incentive to qualify for these may induce firms to implement the management principles that will facilitate gaining scale.

The third argument is a close cousin of the classic “infant industry” arguments. State aid allows firms to pay for fixed costs associated with technologies that have low marginal costs. If EU firms do not benefit from the capital markets that US firms have, then state financing could in principle (imperfectly) substitute for this access to capital. In other words, perhaps scaling requires a “push” in the form of state aid to overcome some of the comparative disadvantages that the EU has relative to the US.

4.2. Is industrial policy scale biased?

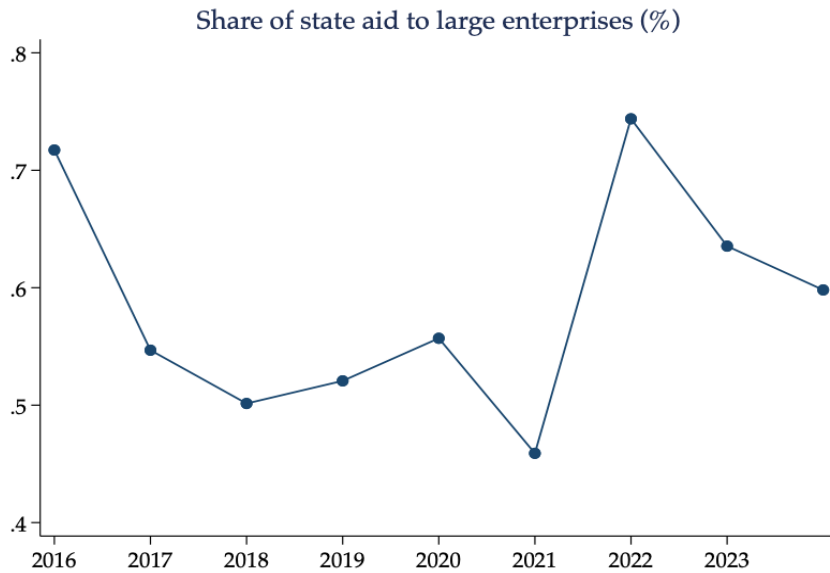
All these arguments must be confronted with whether, in practice, state aid seems to go to large firms. Figure 4 from Reichardt and Reis (2024b) uses the universe of all state aid awarded in Europe and reported to the European Commission, to plot the share of it that has gone to large enterprises. Currently, a large enterprise is defined as having more than 250 employees, more than 50 million euros in annual turnover, and a balance sheet larger than 43 million. These firms account for approximately 30% of employment. Yet, as Figure 4 shows, they have received consistently more than 40% of all state aid.

This is not an EU peculiarity. The US data shows a steeper gradient, whereby state aid to the largest firms is a larger fraction of all state aid than it is in Europe (Reichardt and Reis, 2024b). There is no comparable accessible data for China, but all informal evidence points likewise in the same direction. Industrial policy is biased towards larger firms, by design or by accident. Therefore, potentially it can play a role in letting firms attain scale.

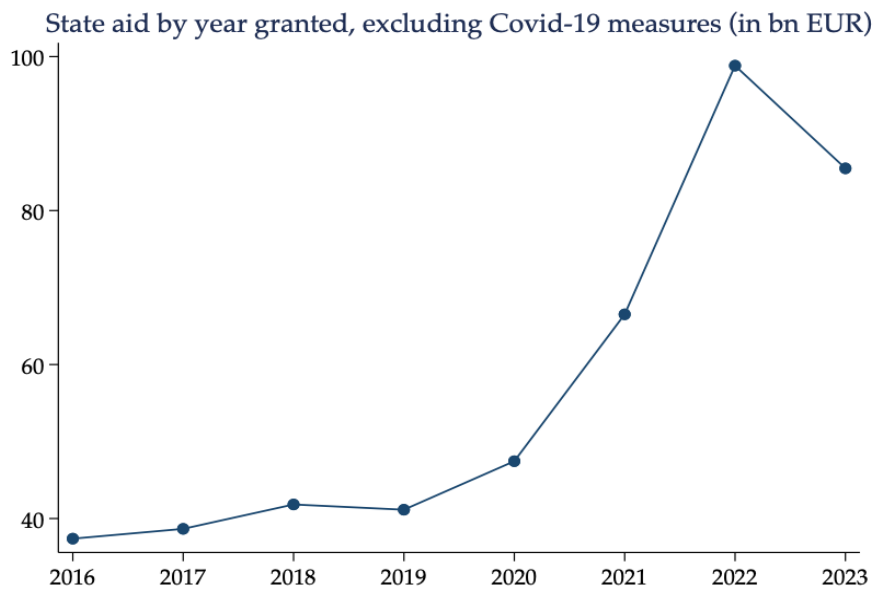
4.3. Reasons for scepticism: the time series

State aid has exploded in Europe since 2021. Figure 5 shows the total amount awarded, which in 2021-23 was on average roughly twice higher than the average in 2006-19. The direct reason for this spurt was the suspension of many EU constraints on state aid, first in the aftermath of the pandemic, and afterwards as a response to the economic impact of the Russian invasion of Ukraine.

Did this large increase in industrial policy lead to the more innovative firms or to a burst in scaling? Nothing in the data points in that direction. The data on who received this state aid still needs to be analysed systematically. Nevertheless, at least for now, there is no sense that this doubling of state aid changed the gap in scaling between the US and the EU.

Figure 4: The scale bias of industrial policy in the EU

Source: Reichardt and Reis (2024b)

Figure 5: Amounts spent in state aid in the EU

Source: Reichardt and Reis (2024b)

4.4. Reasons for scepticism: picking winners

In many markets, there is more than one European company with large scale. These companies compete for the EU market. Even as one might hope that at least one of them gains scale and dominates the world market, the competition in Europe is important to keep prices low for consumers. It is difficult to draw a line between policies directed at letting EU companies attain scale, while at the

same time not harming competition within the EU. This is a delicate balance that is hard, if not impossible, to achieve.

Trying to “pick a winner” is one of the practices that has given industrial policy a bad reputation. It often involves sacrificing competitors in the domestic market in the hope of gaining scale in external markets. This hope is often not realised and only the losses in competition and consumer welfare remain.

4.5. Reasons for scepticism: race to the bottom

If the EU were to more actively use industrial policy to allow its firms to acquire scale, it is reasonable to expect that its major trading partners may react. After all, some of the overall support for industrial policy in debates today is in response to its active use by Chinese authorities for many years and by the US authorities more recently. When considering its use, one must take into account the possibility that this will lead to a zero-sum game with, in the end, public money wasted with no effect.

A different race to the bottom is specific to the EU. Industrial policy is conducted at the national level. If one country supports one of its companies to acquire scale, this may lead to a similar company in another country receiving similar support to compete for the EU domestic market. In the end, while the industry overall may receive the support to acquire scale, this comes with duplication of efforts across countries. There is a race to the top in industrial policy akin to the race to the bottom in corporate taxes.

There is a more pernicious version of this mechanism. Some countries have more fiscal space than others, partly because of carrying lower debt, partly because they benefit from a safe asset status during crises. Those countries will be able to support their national companies more, regardless of whether they are the more promising ones to gain scale and become world leaders. It is a founding principle of the EU that the playing field is level within the national market. Embracing industrial policy strikes at the heart of this principle.

4.6. Reason for scepticism: addressing the root causes of the EU-US gap

Going back to the previous section, industrial policy at best addresses the lack of a capital market. It does not address any of the other potential reasons why EU firms have trouble scaling and move to the US when they reach that state.

Even when it comes to capital markets, as discussed in section 3.6, it seems the root of the problem is at later stages of financing, when large amounts are involved. It seems dangerous to be committing to state aid of that scale with the risk involved.

5. CONCLUSIONS

Every stage in the life of a successful firm is difficult. The stories of the technological leaders of the present are filled with different challenges overcome in the past. For a long time, policy in the EU has been focused on the challenges for new innovative firms to start, especially in ICTs sectors where collateral is scarce, and the rate of failure is large. Looking at the data today, the EU seems to have caught up to the US in its business dynamism and firm creation.

When it comes to growing these firms, from a large successful scale to becoming world leaders, the EU firms leave the picture. Some are unable to take this step, while others move to the US to do so. Why this happens is a major challenge to elevate the EU to become a technological leader, especially if the future comes with a higher extent of increasing returns to scale as hinted at by the use of artificial intelligence.

The discussion in this paper suggests some policies to meet this challenge. Their common feature is the emphasis on the ability to mobilise resources, both capital and labour, to allow for quick scaling up of promising large firms. Mobilising labour may require a more active welcoming policy to skilled immigrants and to promote labour mobility within the EU. Mobilising capital may require a stronger and more agile corporate governance structure that encourages outside investors to enter fast growing firms. Better integrated services markets across national borders would lower the costs of expansion, while better integrated capital markets would lower the costs of raising large amounts of capital. Industrial policy, on the other hand, is as likely to cause harm as to bring benefits.

None of these policies are silver bullets, nor are they sufficiently concrete to be implementable. Moreover, some of the shortcomings in this area, and their possible solutions, are common to other diagnosis of other issues in the European economy. The absence of large world-leading technological firms in Europe is still more accurately described as a puzzle. The hope is that the emphasis on scaling brought here brings new light on what must be done.

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The EU has grown less, and has become less productive, than the US in the last twenty years. The differences are small, but a healthy ambition to do better justifies analysing the sources of this difference and how policy can affect them. This paper focuses on the pattern of specialisation of the EU economy and discusses the role of large firms in generating innovation. It documents the large US-EU gap in the ability to scale large firms and grow them into world leaders, and discusses the reasons that can be behind it, as well as what policies may change this. Focussing on industrial policy, it discusses its potential together with several reasons to be sceptical that the potential could be realised. It concludes that promoting more movement and better allocation of capital and labour within the EU are general priorities.

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