

Low productivity of European firms: how can policies enhance the allocation of resources?*

Grégory Claeys, Marie Le Mouel and Giovanni Sgaravatti

Executive summary

- This paper summarises the most important policy lessons from the research undertaken in the MICROPROD project, work package 4, related to the allocation of the factors of production, with a special focus on the weak dynamism of European small and medium-sized enterprises (SMEs).
- In particular, MICROPROD work package 4 investigated the impact of labour market institutions and skill shortages on firm dynamism, and which types of (foreign) competition are conducive for total factor productivity (TFP) maximizing factor allocation.
- The papers of this work package also explored the side effects of unconventional monetary policy and of forbearance in bank restructuring for the survival of 'zombie' firms, and for employment growth and the TFP of new SMEs.

1 Introduction

Economists take total factor productivity (TFP) as one of the most informative indicators of the state of a country's economy, and as a predictor of its future performance. TFP is an indicator of technological development and on everything going into the production process that is not strictly labour or capital. TFP growth is important for increasing living standards¹ and is a key indicator for European economies, which have little scope for growth from

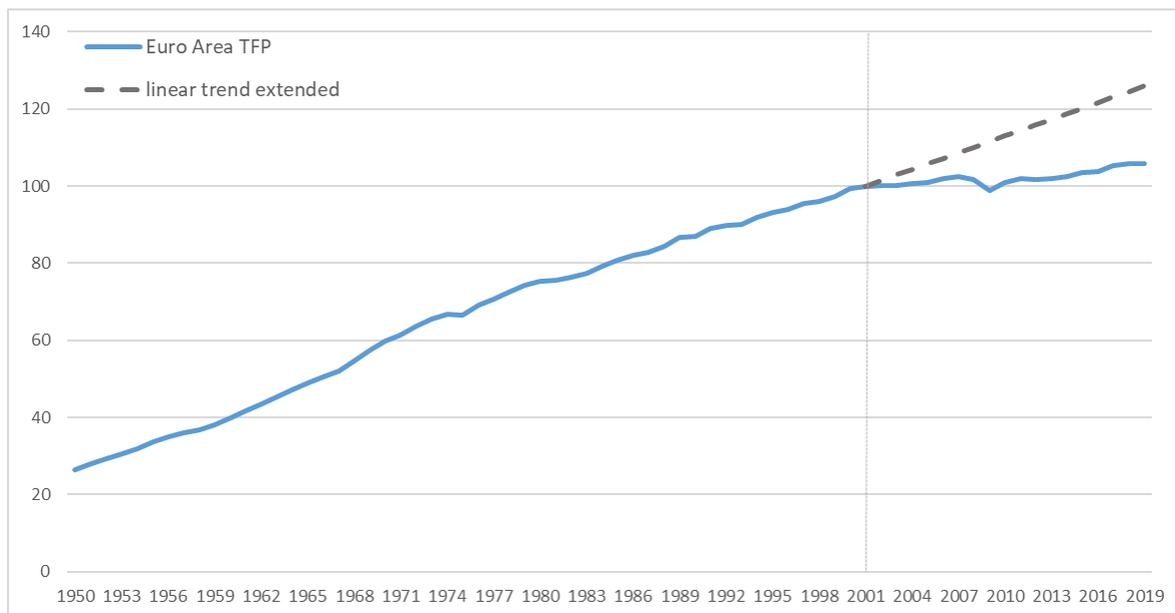
* The authors acknowledge funding from the European Union Horizon 2020 research and innovation programme under grant agreement no. 822390 (MICROPROD). This work reflects only the authors' view and the European Commission's Research Executive Agency is not responsible for any use that may be made of the information it contains.

¹ The introduction of cell phones in the fishing industry in Kerala state in India is a striking example of the power of adoption of new technologies and improvements to the allocation of resources. After returning with their morning catch, fishermen used to go to the closest beach to sell what they could. Given that the catch varied significantly from day to day, this resulted in either waste, when the supply of fish exceeded local-market demand, or in empty-handed customers when the catch was too small. When phone connectivity became available, fishermen started to call before coming ashore, to understand where there were more customers waiting and where boats were scarce. This acted as a price stabiliser and made both fishermen and customers better off, while reducing waste to virtually zero (Jensen, 2007). In addition, when travelling to multiple villages, fishermen discovered new boat-builders who in some instances could make much better boats than the local boat-builders they had always relied on. This resulted in more work for the best craftsmen, who could then expand their businesses and use their boat-building infrastructure more efficiently, while the worst boat-builders went out of business. The end result was lower prices and more durable boats for fishermen, and more stable fish supply and prices for customers (Jensen and Miller, 2018).

factor accumulation: labour growth is more constrained than in developing countries for demographic and labour-market reasons, and capital accumulation is generally set on a steady-state trend. It is therefore crucial for European economies to allocate these two scarce input factors in the most efficient way possible (the extent to which this works well is called allocative efficiency and is one of the drivers of TFP), while improving everything from management practices to energy efficiency.

However, in the past 20 years GDP growth in Europe has slowed significantly. The decline in TFP growth is the main reason for that. Unsurprisingly, sluggish TFP growth, dubbed the ‘productivity puzzle’ became the topic of intense research. In 2001, coinciding with the bursting of the dot-com bubble and the admission of China to the World Trade Organisation, European TFP almost stopped growing and never returned to its previous trend. The productivity gap – the difference between the current level of TFP and the level it would be at had it kept growing at the same rate as the previous half-century – is now around 20 percent (Figure 1)².

Figure 1: Euro-area total factor productivity (TFP) and 1950-2001 trend line, 2001=100



Source: Bruegel based on Bergeaud et al (2016), database updated in 2019 available at <http://www.longtermproductivity.com/>

One reason for this slowdown might be linked to the advent of the digital age and the difficulties encountered by statisticians and economists in measuring the value of such new

² TFP growth was particularly buoyant in the 30 years from 1950 to 1980, averaging 3.6 percent per year. It then slowed between 1981 and 2000, averaging 1.4 percent per year, before stagnating from 2001 to 2019, averaging only 0.3 percent per year.

technologies in official statistics³. But measurement only explains part of the sluggish TFP growth in Europe (Syverson, 2017). Another theory seeking to explain sluggish productivity growth is ‘secular stagnation’, which sees the TFP slowdown as a savings-investment imbalance caused by various factors (including demographics and the rise in inequality), which have led to a global savings glut and underinvestment (Summers, 2013). However, the active macroeconomic management of the past decade does not appear to have reversed the secular productivity trend. This means that it is also crucial to explore potential underlying structural issues at the micro-level.

In terms of the production processes of firms, the allocation of inputs happens at three distinct levels: within firms, among firms in a specific sector, and across sectors⁴. According to classic economic theory, a resource is allocated optimally within a firm when its marginal cost equates to its marginal return (Petrin and Sivadasan, 2013). A deviation from such equivalence implies a wedge between marginal cost and marginal return, meaning that the input is either used too much or too little.

Within a sector, allocative efficiency is achieved when this equivalence holds for all firms in the sector. Resources are free to move between firms and are employed by the most productive firms. This implies that unproductive firms will gradually lose inputs and exit the market, while freeing-up resources for new or more productive firms.

Similarly, at the cross-sectoral level, allocative efficiency is obtained when input factors are allocated well between the most and least-productive sectors of a country’s economy. All these dimensions are interlinked: a firm that employs too much of a production factor and hence faces a marginal cost greater than the marginal return, could make more profit by reducing its use of that factor. The resources set free can then be employed by other more-efficient firms, where the marginal return of that resource is greater than its marginal cost. This will increase the efficiency of using resources and aggregate welfare gains for the industry and, in turn, the whole economy. Bartelsman *et al* (2013) estimated that misallocation was responsible for a sizeable GDP gap between transition economies (during European Union enlargement) and the EU average.

This working paper summarises the most important policy implications from recent academic research (undertaken in the MICROPROD project work package 4) exploring these various aspects of factor allocation, and seeks to explain the main reasons for the weak dynamism of European SMEs (see Table 1 for short summaries of the MICROPROD papers).

³ Underestimating value-added, the numerator in any productivity computation, mechanically leads to underestimating TFP.

⁴ Considering the aggregate EU TFP then there is a further level of allocative efficiency at the EU inter-country level.

Table 1: Summary of MICROPROD papers work package 4

Paper	Results	Policy recommendations
Allocative efficiency of labour		
D4.5 Vacant positions and firm performance	Job vacancies have a negative effect on firms' sales and investment. Vacancies tend to be persistent through time.	Improve the matching of labour supply with labour demand.
D4.7 Decentralisation of collective bargaining: A path to productivity?	Multi-level contractual bargaining had a more positive effect on productivity growth after the financial crisis than centralised or individual bargaining.	Encourage intermediate forms of labour decentralisation, with sectoral negotiations followed by firm-level collective contracts.
D4.6 Does offshoring shape employers' labour-market power? A comparative analysis of Belgian and Dutch firms	In both Belgium and the Netherlands, offshoring activities act as a disciplining factor for labour market imperfections. Two types of imperfection prevail at the firm level, favouring either workers or employers.	Labour-market power dynamics need to be monitored and their aggregate impact on the labour market should be evaluated to optimally design policies.
D4.1 Import competition and allocative efficiency	Import competition has a disciplining effect on manufacturing firms to improve their allocation of labour.	If efforts to shorten supply chains lead to a reduction in import competition, this might have negative repercussions for productivity in the manufacturing sector.
Allocative efficiency of capital		
D4.2 Financial markets and the allocation of capital: the role of productivity	Incomplete financial markets have a negative effect on capital allocation and productivity. Capital markets seem to work better in France than in Germany, while allocative efficiency is particularly poor in Italy.	It is crucial to bring about the EU's capital markets union to alleviate the financial constraints preventing the efficient allocation of resources in Europe.
D4.3 The cleansing effect of banking crises	Lower regulatory forbearance during a crisis increases job creation, innovation and firm entry after the crisis.	Regulators should take productivity and employment growth into account when carrying out cost-benefit analyses of being more or less lenient towards banks.
D4.4 Tracking the real effects of monetary policy: evidence from European Central Bank's SMP purchases	Expansionary monetary policy can induce banks to conduct their monitoring function more stringently, ultimately leading to investment and productivity advancements among their corporate credit customers; however it can also negatively impact employment and sales.	Given the extent of monetary intervention in the economy in the last decade, more study should be devoted to its effect on productivity and on capital allocation.

Source: Bruegel based on MICROPROD work package 4 papers. Note: For a more comprehensive account of policy recommendations from the multiple MICROPROD working packages see Claey's and Demertzis (2021).

2 Enhancing productivity through labour market design

As pandemic-related restrictions are eased across the globe, a new and possibly different labour market is emerging. Widespread social distancing to counter COVID-19 has accelerated digitalisation, which in turn has entrenched remote working and led to faster adoption of artificial intelligence in the job market (Malluk Batley, 2021). Moreover, young people and women have been more exposed than men to the negative effects of COVID-19 on the job market, while some sectors were more impacted than others by lockdowns and restrictions (Grzegorzczuk and Wolff, 2020; Demertzis and Hoffmann, 2021). In such a complex situation, the results from four MICROPROD papers from package 4 can help policymakers design policies to improve allocative efficiency. In D4.5 Gyöngyösi *et al* (2020) warned about the negative impacts on labour allocation of skill shortages. Their warning is particularly timely in the context of what has been labelled *The Great Resignation*, a phenomenon in which 4.2 million workers in the US decided during the pandemic to resign from their jobs, creating shortages of workers for specific occupations (*The Economist*, 2021). Although the phenomenon is particularly evident in the US and the UK, there are reasons to believe that skill shortages might also appear in European countries with tight labour markets. In January 2022, Germany's vice-Chancellor said the country would soon have one million vacancies to fill as a result of the energy transition and an aging population (Escritt and Nienaber, 2022). Both these long-term trends will be combined with the tensions in the labour market triggered by the reopening of the economy. Smart migration policies, *ad-hoc* training programmes and systems to facilitate good matching of labour market supply and demand should be rolled out. Shortages in the labour market could also contribute to rising inflation by augmenting employee bargaining power and ultimately leading to a wage-price spiral.

This is why investigating the power dynamics between employers and employees is crucial. In D4.6, Dobbelaere *et al* (2020a) found that in both Belgium and the Netherlands, different types of labour-market imperfections coexist. Similarly, in D4.1, Slavtchev (2020) extended analogous research to 13 European countries while focussing on the manufacturing sector. These papers suggest in particular that trade openness and import competition have a positive effect on labour allocation. Such productivity considerations should be taken into account when discussing the option of shortening value chains to increase the strategic autonomy of the European Union (European Commission, 2021).

Finally, digitalisation and remote working might also increase the diffusion of freelancing and the adoption of contracts agreed on an individual basis between the employee and the employer (Ioannou, 2021). Such developments might be negative from the perspective of labour allocation, as found in D4.7 by Aglio and di Mauro (2020), whose results indicate that the type of contract to be preferred from a productivity perspective is that agreed at the multi-level basis (ie sectoral negotiations followed by firm-level collective contracts).

An imperfect allocation of labour could come from job-search frictions as well as from a mismatch between skills demanded by employers and supplied by workers. Such frictions and mismatches could in turn restrain employment and profits (Kaas and Kircher, 2015). On that topic, Gyöngyösi *et al* (2020, MICROPROD paper D4.5) estimated that Hungarian firms reporting vacant positions (as a consequence of employees poached by other firms) display lower employment growth and lower sales and investment levels in the subsequent quarter, than firms with no vacancies. However, the negative effect of vacant positions is greatest in the year following the reported vacancy, and does not fade out even after two years. At the same time, firms reporting vacancies tend to increase the wages of their remaining workers belonging to the same skill set as the vacant job, and the productivity of remaining employees is not negatively affected. The authors estimated that one vacant position decreases firms' sales by 1 percent and investment by 2 percent, while negatively impacting cumulative growth by 0.88 percent over the two years following the vacancy for a skilled worker.

Another important finding of this MICROPROD paper is that vacancies seem to be particularly persistent through time, with firms displaying a 40 percent probability of reporting a vacancy ten quarters after the first job post was reported. These numbers, together with the fact that in 2016 every fourth firm missed blue-collar workers, and one in ten reported vacant positions of managers or professionals, warn of the possible negative effect of poor allocation of labour. As indicated above, the current economic recovery poses risks of skill shortages and should prompt policymakers to improve the matching of labour demand with labour supply through training schemes and migration policies.

A skill-shortage of employees might also result in a shift in the bargaining power between employers and workers, favouring the latter. It is in this context that research such as that by Dobbelaere *et al* (2020a, MICROPROD paper D4.6) becomes crucial in understanding the bargaining dynamics in the labour market, and helping policymakers to design informed policies. Dobbelaere *et al* (2020a) found that in 50 percent of Belgian and 40 percent of Dutch firms, employees have excessive market power, which is reflected in wages above the marginal product of labour. In both countries, 30 percent of firms have the upper hand and exercise their power to pay wages below workers' productivity. This leaves only 20 percent of firms in Belgium and 30 percent in the Netherlands setting wages at the optimal level⁵. The authors also found that offshoring improves employers' bargaining positions. Firms with offshoring activities, for either finished or intermediate goods, are more likely to impose wages lower than the productivity of their employees. The authors also found that in both

⁵ In a study on Germany, Dobbelaere *et al* (2020b) confirmed that imperfect labour markets are the norm rather than the exception. Unlike Belgium and the Netherlands, however, in Germany the market power of employers dominates that of workers on the labour market, even if union wage setting and works councils put limits on employer labour market power.

countries, the absence of labour market power (that is, wages equating to workers' productivity levels) is greater among firms engaged in offshoring. Therefore, offshoring seems to have a positive effect on labour allocation in both countries. However, this is not necessarily the case everywhere – Belgium and the Netherlands both have very well-developed wage-bargaining regulations – and it needs further investigation.

Using a similar definition of allocative efficiency as above and extending the research into the disciplining effects of openness to trade across 13 European countries, Slavtchev (2020, MICROPROD paper D4.1) found that between 2003 and 2016, import competition forced manufacturing firms to improve their allocation of labour and led to the exit of those firms that remained unproductive, freeing resources for other more productive firms. Such results are aligned with classic economic theory and indicate how free trade can have a productivity-enhancing effect on a country's economy. This is something that should not be neglected when discussing the possible implications of shortening value chains to improve resilience and strategic autonomy in the aftermath of the pandemic.

In addition to the external pressure exerted by offshoring and import competition, internal bargaining dynamics also shape wage setting and the resulting allocation of labour. Aglio and di Mauro (2020, MICROPROD paper D4.7) gave an overview of how the situation in Europe has evolved in the last decades. In central and eastern Europe (CEE), most wage negotiations now take place outside collective bargaining schemes. Firms generally sign individual agreements with their workers and the share of collective bargaining is rather low (about 40 percent). On the other hand, firms in western Europe mostly adopt a centralised system (through national or sectoral collective agreements), which is virtually absent in CEE countries (excluding Romania). When adopting a decentralised system – within collective bargaining – western European countries embrace 'multi-level bargaining', ie an intermediate form of decentralisation in which sectoral negotiations are complemented by firm-level collective contracts. The authors show how this latter form of decentralisation had a positive effect on total factor productivity growth in the aftermath of the great financial crisis. Confirming the importance of the multi-level nature of bargaining, Mueller and Neuschaeffer (2021, MICROPROD paper D 5.1) showed that in Germany, firms that have plant-level work councils report productivity that is 13 percent higher than firms where wage bargaining takes place at the sector-level only. Importantly, plants that have both layers of bargaining in place are the most productive. Aglio and di Mauro (2020) also reported how the percentage of firms outside collective bargaining (ie 'individual contracts') significantly reduced the average TFP performance at the sectoral level, giving support to the literature which shows that individual contracts do not lead to more efficient allocation of resources and productivity (Peetz and Preston, 2009).

Multilevel decentralisation of wage-bargaining may improve TFP by, first, lowering unit labour costs (allowing a better match between productivity and wage), and second, because

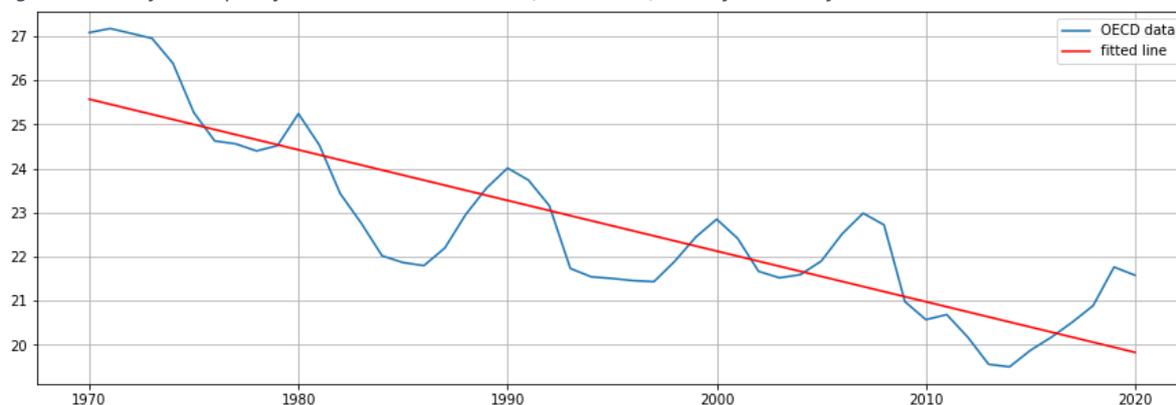
of fewer dismissals in arduous times, which allows workers and firms to maintain skills. Moreover, multi-level bargaining seems to be positively correlated with TFP dispersion, suggesting that more flexible wage structures allow highly productive firms to expand more easily than under centralised agreements (Aglío and di Mauro, 2020; MICROPROD D4.7).

In addition to the factors discussed, the major determinant of labour productivity is the amount of capital that workers have at their disposal. However, similarly to labour, capital is also a finite resource, the efficient allocation of which in the economy is vital for productivity. To have the possibility to grow and expand in promising areas of development, firms thus need access to capital to invest in the opportunities they think most profitable. This is what we now turn to in section 3.

3 Allocation of capital, the key role of banks

For the last 50 years, investment⁶ in the euro area as a percentage of GDP has been on a clear decreasing trend (Figure 2). This raises questions about the allocation of capital and how to improve it in the European Union. Is the decline a consequence of capital constraints in Europe? Could it be that the predominant role of banks in credit allocation in Europe has a constraining effect on investment? Could the EU's capital markets union help to foster investment and improve capital allocation?

Figure 2: Gross fixed capital formation in the euro area, 1970-2020, as % of GDP and fitted line



Source: Bruegel based on The World Bank and OECD National Accounts.

⁶ Gross fixed capital formation (GFCF), also called 'investment', is defined as the acquisition of produced assets (including purchases of second-hand assets), including the production of such assets by producers for their own use, minus disposals. The relevant assets relate to assets that are intended for use in the production of other goods and services for a period of more than a year. The term 'produced assets' means that only those assets that come into existence as a result of a production process are included. It therefore does not include, for example, the purchase of land and natural resources (OECD definition).

The allocative efficiency of capital is not easily measurable and theoretical constructs are often very difficult if not impossible to verify empirically because of the lack of data⁷. Di Mauro *et al* (2020, MICROPROD paper D4.2) made an important contribution to the literature by designing an innovative theoretical framework to compute such estimates using available data from the CompNet database. The intuition behind the methodology is that with well-functioning financial markets, firms immediately respond to a positive TFP shock by investing all their resources in short-term projects to increase production. On the other hand, in financial markets suffering credit constraints, firms are more cautious and respond to a positive productivity shock by foregoing some investment opportunities (opportunity cost effect), and instead raise additional funds to weather potential future negative shocks (liquidity effect). That happens because firms operating in poorly functioning financial markets cannot rely on banks to raise the required funding in adverse conditions to the same degree as firms operating in well-functioning financial markets.

Testing their model in the three biggest countries of the EU, the authors found evidence that the opportunity cost effect of current TFP growth dominates in France and Germany, while the liquidity effect dominates in Italy. They also found that the size of the coefficients is larger for France than for Germany, suggesting that credit allocation is more efficient in France than in Germany. At the micro level, the elasticity of credit to TFP in France and Germany seems to suggest that bank credit is allocated more efficiently across small firms, than across large firms.

Poor credit allocation is associated with the rise of so-called ‘zombie firms’: businesses that would typically exit in a competitive market but stay afloat thanks to market imperfection and government support. In 2017, the OECD found an increasing survival rate of zombie firms over the previous decade (OECD, 2017). Thanks to the substantial subsidies rolled out by European countries to help economic activity during 2020 and 2021, the survival rate of zombie firms might have increased (*The Economist*, 2020). Altomonte *et al* (2021) reported that government support during the COVID-19 pandemic went systematically to the least productive firms in Germany and in Italy (but less so in France). This could become a problem in the future as the presence of zombie firms hampers productivity growth by crowding-out growth opportunities for more productive firms, especially start-ups.

The OECD suggested that the problem of zombie firms in Europe is intertwined with banking sector weakness and bank forbearance, ie the tendency for weak banks to bet on the resurrection of failing firms (Andrews and Petroulakis, 2017). As emphasised by the OECD, policies designed to tackle this issue should aim to improve the design of insolvency regimes and reduce barriers to corporate restructuring, while investing in job-search and retraining

⁷ The most common method for estimating capital allocation is Tobin’s Q (or the Q ratio). This is the ratio between the market value of a physical asset and its replacement value. If $Q=1$ then the capital is correctly allocated, $Q>1$ signals capital underinvestment and $Q<1$ overinvestment.

programmes to help displaced workers find new occupations in more productive firms or sectors (Andrews *et al*, 2017).

The research conducted by Gropp *et al* (2020, MICROPROD paper D4.3) confirmed that bank forbearance on firms is very much related to supervisory forbearance – ie regulators being particularly lenient in supervising banks. The authors investigated the impact of supervisory forbearance in the United States during the great financial crisis on subsequent labour productivity growth. Forbearance implies that legacy assets remain on the balance sheet, and the bank itself continues to have incentives to avoid realising losses⁸. The authors found that US regions where supervisors played their role more stringently experienced higher labour productivity growth after the crisis with more firm entries, more job creation, and higher employment, wages, patents and output growth. The study concluded that one standard deviation higher supervisory forbearance during the crisis led to approximately a 2.9 percentage point lower rate of establishment exits and job destructions, which, after the crisis, resulted in a 3.6 percentage point lower rate of entry and job creation. Overall, for every job lost due to lower supervisory forbearance (ie regulators being more stringent in supervision), there were 1.05 jobs created after the crisis, showing that tighter supervision was not costly on aggregate in terms of jobs in net terms. These results expose the inherent trade-off between short-term pains and long-term gains. Not all financial institutions are systemically important and the risks from saving all banks could be higher than the risks associated with letting some fail.

Since the financial crisis, central banks have had to resort to unconventional monetary policy to contain the negative effects on the economy of subsequent crises. Cycon *et al* (2020, MICROPROD paper D4.4) investigated the capital-allocation effects in Germany during and after the first sovereign asset purchase programme – the Securities Market Programme (SMP) – by the European Central Bank (ECB) during the European sovereign debt crisis. They found that firms indirectly affected⁹ by a positive liquidity shock reduced employment, but also increased their levels of assets. Based on the two most conservative methodological approaches, the long-term differential employment effect in the two years following the unconventional monetary policy measure varied between minus 3.7 percent and minus 6.1 percent, while the effect on asset growth ranged between 8.9 percent and 11.7 percent. The authors also found a negative effect on sales (between minus 2.2 percent and minus 4.1 percent) and a positive effect on labour productivity (in the range of 2.2

⁸ For banks close to the minimum capital requirement, loan loss provisioning is costly since they may fall below the minimum threshold. Therefore, they have an incentive to continue financing non-performing loans. Reasons for higher supervisory forbearance are various. For example, local regulators are normally more lenient on distressed banks than federal supervisors as they weigh local economic factors more; also the distance to the regulator's headquarters is a factor, because of revolving doors (state officials changing career and going to work for a bank not too far away).

⁹ These are firms in business relationships with banks holding assets that were affected by the SMP conducted by the ECB between May 2010 and September 2012.

percent to 3.5 percent). The asset purchase programme might thus have induced banks to conduct their monitoring functions more stringently, ultimately leading to investment and productivity advancements among their corporate credit customers, while negatively impacting employment and sales.

4 Conclusions

Productivity growth can be greatly limited by the misallocation of labour and capital. Well-performing firms might struggle to hire all the employees they need, while other less-productive businesses employ more workers than necessary. Similarly, some brilliant entrepreneurs may give up on revolutionary ideas because they are unable to finance them, while others might continue to invest in projects with little value-added. Therefore, policymakers need to pay particular attention to the important role played by the way input factors are allocated within the economy, because such allocation might limit or foster growth potential. The papers from MICROPROD package 4 stress the importance of active policies in the labour market, especially in the context of the exit from the COVID-19 crisis. Policies may vary from work training programmes to new schemes to reduce the persistence of job vacancies by matching labour demand with supply. Policy should also promote multi-level bargaining over work contracts, with sectoral negotiations followed by firm-level collective contracts. The research carried out in this package has pointed out the extent of imperfections in European labour markets, with work agreements that tend to favour either employees or employers. Moreover, the research presented here also warns of the possible negative effects the shortening of supply chains in Europe could have on productivity. This economic perspective, even if it will have to be balanced with geopolitical and strategic considerations, should be taken into account in the discussions on the resilience of the EU economy in the face of external events.

The papers also dealt with the functioning of capital markets in Europe, pointing to the urgency of making progress on the EU's capital market union to alleviate financial constraints that prevent the more efficient allocation of financial resources. Another contribution analysed the trade-offs between the short and long-run effects on employment and TFP growth of unconventional monetary policy, and of excessive supervisory forbearance in bank restructuring. As policymakers strive to design policies to ensure the quickest possible recovery after the crisis, the results from MICROPROD package 4 should be given the attention they deserve. Enabling the efficient allocation of labour and capital across the economy could be a game-changer for the EU economy in the years ahead, and might help solve the 20-year-old issue of stagnant productivity in Europe.

References

- Aglione D., Di Mauro F. (2020) "Decentralisation of collective bargaining: A path to productivity?", MICROPROD Deliverable D4.7
- Altomonte, C., Demertzis, M., Fontagné, L., & Mueller, S. (2021) 'COVID-19 financial aid and productivity: has support been well spent?'. *Bruegel-Policy Contributions*.
- Andrews, D. and F. Petroulakis (2017), "Breaking the Shackles: Zombie Firms, Weak Banks and Depressed Restructuring in Europe", OECD Economics Department Working Papers, No. 1433, OECD Publishing, Paris, <https://doi.org/10.1787/0815ce0c-en>.
- Andrews D. McGowan M. and Millot V. (2017) "Zombie firms and weak productivity: what role for policy?" [Productivity Workstream](#), OECD Economics Department
- Arnold J. M., Nicoletti G., Scarpetta S. 2008 'Regulation, Allocative Efficiency and Productivity in OECD Countries: Industry and Firm-Level Evidence', OECD Economics Department [Working Paper No. 616](#)
- Bartelsman, Eric, John Haltiwanger, and Stefano Scarpetta. 2013. "Cross-Country Differences in Productivity: The Role of Allocation and Selection." *American Economic Review*, 103 (1): 305-34.
- Claeys, G. and M. Demertzis (2021) 'The productivity paradox: policy lessons from MICROPROD', *Policy Contribution 01/2021*, Bruegel
- Cycon, Koetter and Meller (2020) "Tracking the real effects of monetary policy: evidence from European Central Bank's SMP purchases", MICROPROD Deliverable D4.4
- Demertzis M. and Hoffman M. (2021) "The socioeconomic effects of COVID-19 on women", [blogpost](#), Bruegel
- Di Mauro F., Hassan F. and Ottaviano G. (2020) "Financial markets and the allocation of capital: the role of productivity", MICROPROD Deliverable D4.2
- Dobbelaere S., Fuss C., Vancauteran M. (2020a) "Does offshoring shape employers' labour market power? A comparative analysis of Belgian and Dutch firms" MICROPROD Deliverable D4.6
- Dobbelaere, S., Hirsch, B., Mueller, S., & Neuschaeffer, G. (2020b). Organised labour, labour market imperfections, and employer wage premia. IZA Discussion Paper 13909.
- Escritt T. and Nienaber M. (2022) "Germany needs greater immigration to avoid labour shortages – minister" [Reuters](#).
- European Commission (2021) "Strategic dependencies and capacities", [Commission Staff Working Document](#).

Gropp, Ongena, Rocholl and Saadi (2020) "The Cleansing Effect of Banking Crises", MICROPROD Deliverable D4.3

Petrin, A., Sivadasan, J. 2013. Estimating lost output from allocative inefficiency, with an application to Chile and firing costs. *Review of Economics and Statistics* 95(1), 286-301.

Grzegorzczak M. and Wolff G. (2020) "The scarring effect of COVID-19: youth unemployment in Europe", [blogpost](#), Bruegel.

Gyöngyösi G., Reizer B., Vonnák (2020) "Vacant positions and firm performance" MICROPROD Deliverable D4.5

Ioannou L. (2021) "A snapshot of the \$1.2 trillion freelance economy in the U.S. in the age of Covid-19", [CNBC](#).

International Labour Organization, Organisation for Economic Co-operation and Development with contributions from International Monetary Fund and World Bank Group, February 2015 <https://www.oecd.org/g20/topics/employment-and-social-policy/The-Labour-Share-in-G20-Economies.pdf>

Jensen, R. (2007) "The Digital Divide: Information (Technology), Market Performance, and Welfare in the South Indian Fisheries Sector." *The Quarterly Journal of Economics*, 122(3), 879–924. <http://www.jstor.org/stable/25098864>

Jensen, R., and Miller, N. H. (2018) "Market Integration, Demand, and the Growth of Firms: Evidence from a Natural Experiment in India." *American Economic Review*, 108 (12): 3583-3625.

Karoly Fazekas & Zsuzsa Blasko (ed.), 2016. "[The Hungarian Labour Market 2016](#)," [The Hungarian Labour Market Yearbooks](#), Institute of Economics, Centre for Economic and Regional Studies, number 2016, October.

Kaas, Leo, and Philipp Kircher (2015) 'Efficient Firm Dynamics in a Frictional Labor Market'. *American Economic Review*, 105 (10): 3030-60.

Malluk Batley M. (2021) "AI adoption accelerated during the pandemic but many say it's moving too fast: KPMG survey. Outlook for AI Optimistic Under the Biden Administration; More Want AI Regulation." [KPMG](#)

Mueller, S., & Neuschaeffer, G. (2021). Worker Participation in Decision-making, Worker Sorting, and Firm Performance. *Industrial Relations: A Journal of Economy and Society*, 60(4), 436-478. [MICROPROD Deliverable 5.1]

OECD (2017) "Zombie firms and weak productivity" [research contributions](#).

Peetz D. and Preston A. (2009) "Individual contracting, collective bargaining and wages in Australia", *Industrial Relations Journal*, Volume 40, Issue 5, p. 444-461, <https://doi.org/10.1111/j.1468-2338.2009.00537.x>

Syverson, Chad. (2017) "Challenges to Mismeasurement Explanations for the US Productivity Slowdown." *Journal of Economic Perspectives*, 31 (2): 165-86.

Slavtchev V. (2020) "Import competition and allocative efficiency" MICROPROD Deliverable 4.1

Summers, L.H. (2013) 'Speech at the IMF 14th Annual Research Conference in Honor Of Stanley Fisher', International Monetary Fund, 8 November

The Economist (2020) "Why covid-19 will make killing zombie firms off harder"

The Economist (2021) "Evidence for the "great resignation" is thin on the ground"