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**04**

Post Covid-19  
labor market: any  
scarring?

**08**

Productivity: wide  
divergence across  
countries and  
regions since the  
pandemic

**14**

Wage dynamics:  
The drivers of  
growth

**20**

What does this  
mean for policy-  
makers?

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# No quick wins: more jobs but little productivity in the Eurozone

# Executive Summary



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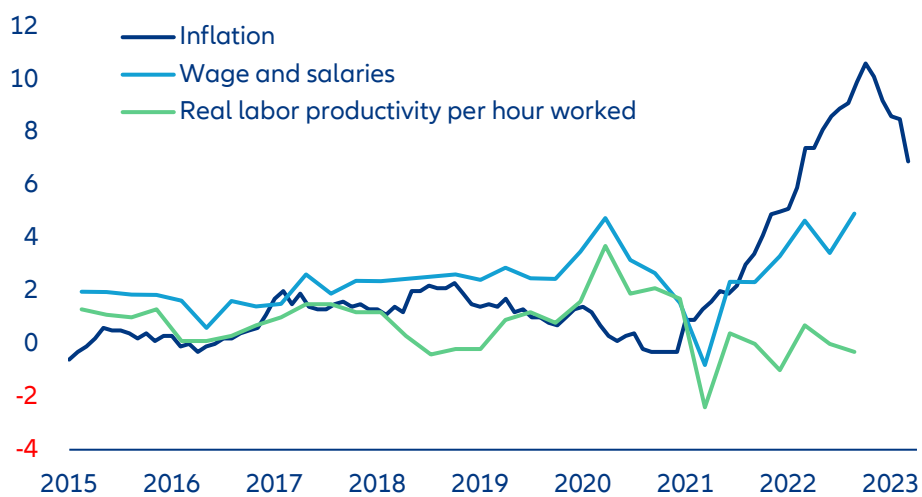
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- **The crisis-related damage to labor markets has not been as bad as expected amid changing consumer preferences and spending behavior.** Employment has increased by 2.3% relative to pre-crisis levels, especially in France and Spain. However, the slow reallocation of labor in the Eurozone has resulted in sluggish productivity growth amid record low unemployment (6.6% in January 2023) as labor markets adjusted via reduced working hours rather than layoffs. Limited productivity gains will hamper a more meaningful recovery, especially in countries and regions with limited labor-market flexibility and a shrinking workforce.
- **The decline in productivity varies significantly across countries due to differences in labor supply and corporate hiring practices.** Italy has seen remarkable productivity growth due to labor scarcity, while other Eurozone economies lag behind. In France and Spain, labor participation and/or job creation have increased sharply, discouraging companies from increasing the efficiency of production and investment. Since companies are increasingly aware that labor is becoming a limiting factor amid deteriorating demographic trends, “labor-hoarding” has also weighed on productivity.
- **Labor scarcity and high inflation has resulted in sustained wage pressures. Wages have also evolved differently across countries, reflecting structural differences of bargaining and collective agreements.** Wage pressures have been somewhat higher in Germany, where rising labor market participation has not helped ease scarcity of workers in several sectors, including construction. Across the largest Eurozone economies, we expect wages to increase by 4-5% this year, followed by 3.5-4.0% next year. While well-anchored inflation expectations suggest that the risk of an adverse price-wage spiral remains small, it cannot be ruled out.
- **Labor-market policies will need to operate in an environment of exceptional uncertainty shaped by both cyclical pressures and secular challenges.** To address the cyclical pressures, policies need to be aimed at adjusting crisis-support measures to encourage a more flexible labor market while protecting the vulnerable. At the same time, structural pressures due to automation and digitalization are becoming more prominent. Active labor market policies should facilitate job-to-job transitions through higher labor and product-market efficiency as well as re-/upskilling, supported by continuous learning programs and changing hiring practices by firms. This could also require public support to incentivize hiring/mobility, ideally in combination with a re-thinking of social protection, including for ‘gig’ workers and to those who lose their jobs or need transition assistance, and educational reforms that help build skills for the workforce of the future.

Figure 1: Eurozone – wages, inflation, and productivity (y/y, %)



Sources: Refinitiv, Allianz Research.

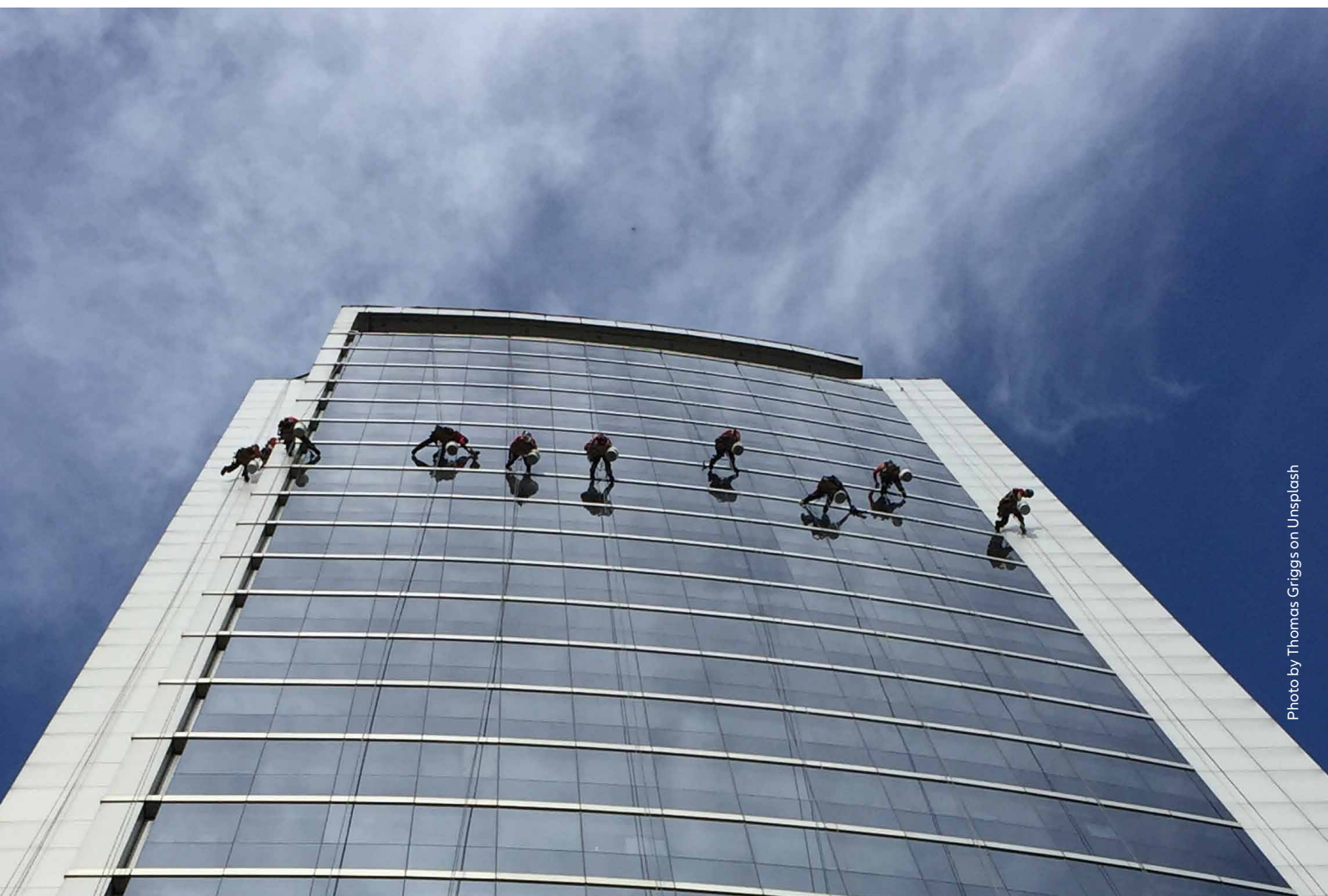


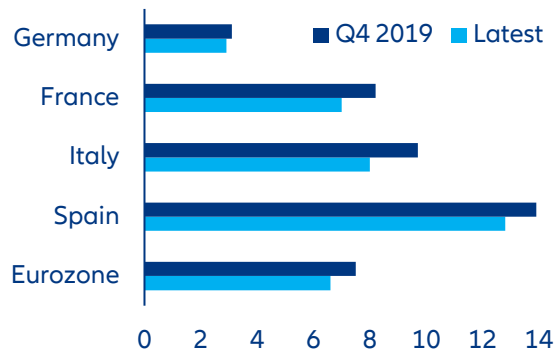
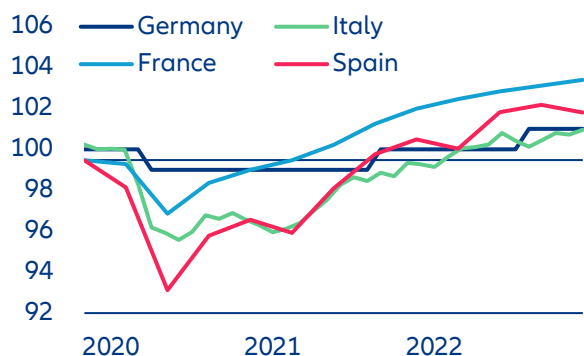


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# Post Covid-19 labor market: any scarring?

Three years after the onset of the Covid-19 pandemic, labor markets have recovered across the Eurozone. Sizeable public sector support (job-retention and unemployment schemes) of about 2% of GDP helped limit the impact on labor markets and protect the most vulnerable households. Only the more contact-intensive sectors hit hard by the pandemic experienced a temporary increase in unemployment rates. At the beginning of 2022, employment levels recovered to pre-crisis levels while the aggregate unemployment rate dropped to a record low (6.6% in January 2023) despite slowing growth (Figure 2). Relative to the pre-crisis period (end-2019), employment has increased by 2.3%. However, average hours worked declined over the period, which has resulted in higher labor productivity per hour (+1.6%) but sluggish productivity per person.

Figure 2: Employment (Q4 2019=100) and unemployment rate (%)

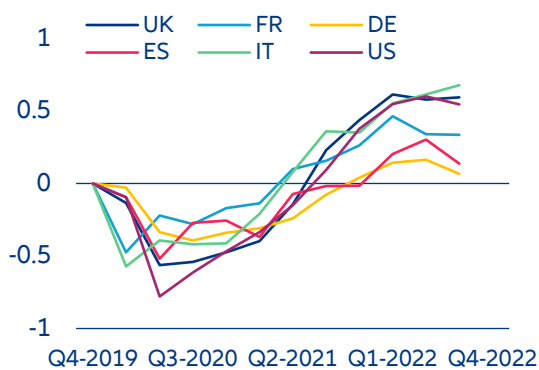
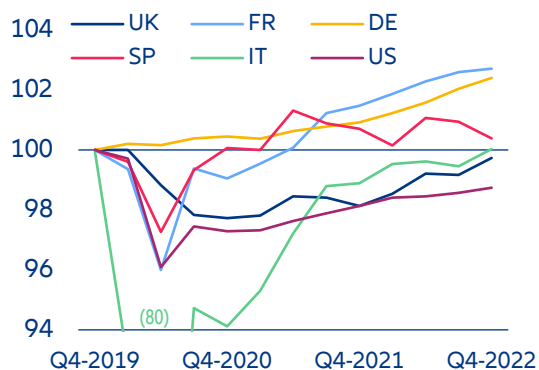


Sources: Refinitiv, Allianz Research.

**Participation rates have quickly recovered in France and Germany, but the labor market remains tight.**

During the pandemic, disadvantaged groups such as low-skilled or older workers, as well as women with young children, exited the labor market, dragging down the participation rate in 2020 (Figure 3). While most of them returned eventually as the pandemic eased, vacancy rates have picked up in the big four economies and remain well above 2019 levels.

Figure 3: Labor-force participation and job vacancy to unemployment rates (deviation from Q4 2019)



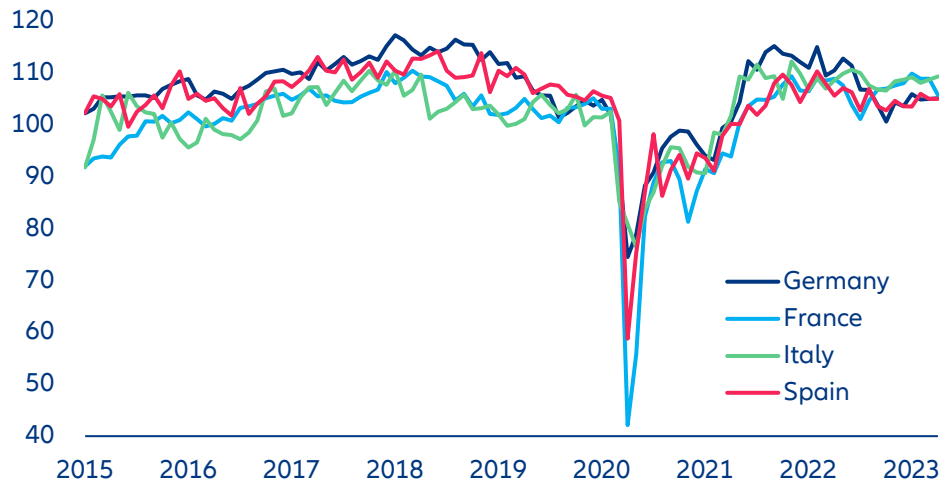
Sources: Refinitiv Datastream, Eurostat, Allianz Research.

Labor-market tightness can also be attributable to a reduction in hours worked. If productivity is catching up, employees are working less hours on average in the post-pandemic world. Average hours worked declined around -1.7% from 2019 to 2022 in the Eurozone. Part of this can be explained by the strong employment creation in the public sector, which on average exhibits lower average hours worked. However, the reduction may also represent a permanent shift in workers' preferences, keeping the labor market tighter in the medium term, which will sustain workers' bargaining power to opt for fewer hours. Ultimately, this seems to result in employers hiring more people to produce the same amount of work.

The pandemic did not spark a material re-allocation of jobs between sectors. Instead, since early 2021, the share of people looking for a job in another firm has increased as job-to-job transitions tend to happen more frequently during economic upturns. Firms compete for workers currently employed by other firms and workers use the opportunity to move to better-paid jobs, which possibly implies some upward pressure on wages.

Despite the ECB's determination to tame inflation and the expected economic slowdown, the latest surveys suggest that employment intentions remain solid across the bloc. The European Commission's Employment Expectations Indicator remained at a sound level at the beginning of 2023 (Figure 4) and March PMIs suggest that Eurozone companies' hiring intentions are holding out, sustaining the current sequence of job creation that started in mid-2020. Moreover, the rate of employment growth recorded was greater than the long-run average and the quickest pace for eight months. However, employment has started to be seen as less of a constraint to production than during the post-pandemic rebound, which could reduce some wage pressures.

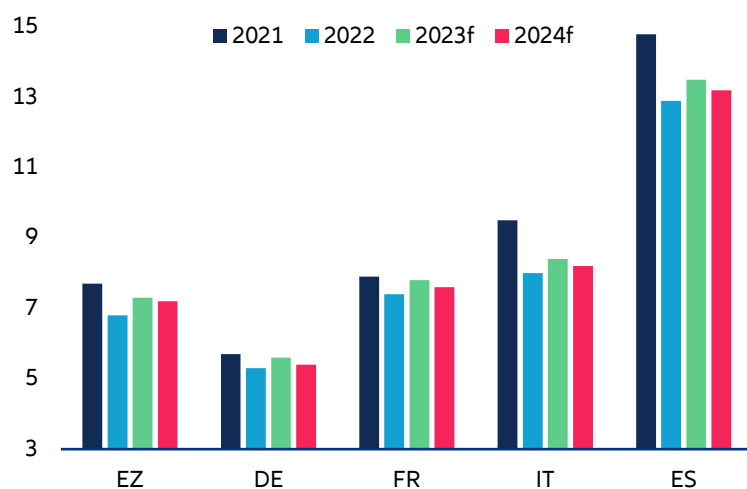
Figure 4: Economic Sentiment Indicator – employment expectations



Sources: Refinitiv, European Commission, Allianz Research.

We expect only limited increases in unemployment through 2024 despite lackluster demand growth – in sharp contrast to previous experiences. The historically elevated number of vacancies and labor shortages in European countries mean that the labor markets will be headed for a soft landing in the next 18 months (Figure 5). Employers will likely shed job openings and prioritize labor-retention strategies in the face of cooling demand, pre-empting a painful re-hiring process (given the scarcity of labor) when economies pick back up from the second half of 2024. Limited increases in unemployment could sustain high wage growth and inflation, pressuring the ECB to deliver more rate hikes than currently expected.

Figure 5: Unemployment rate forecasts (%)



Sources: Refinitiv, Allianz Research.

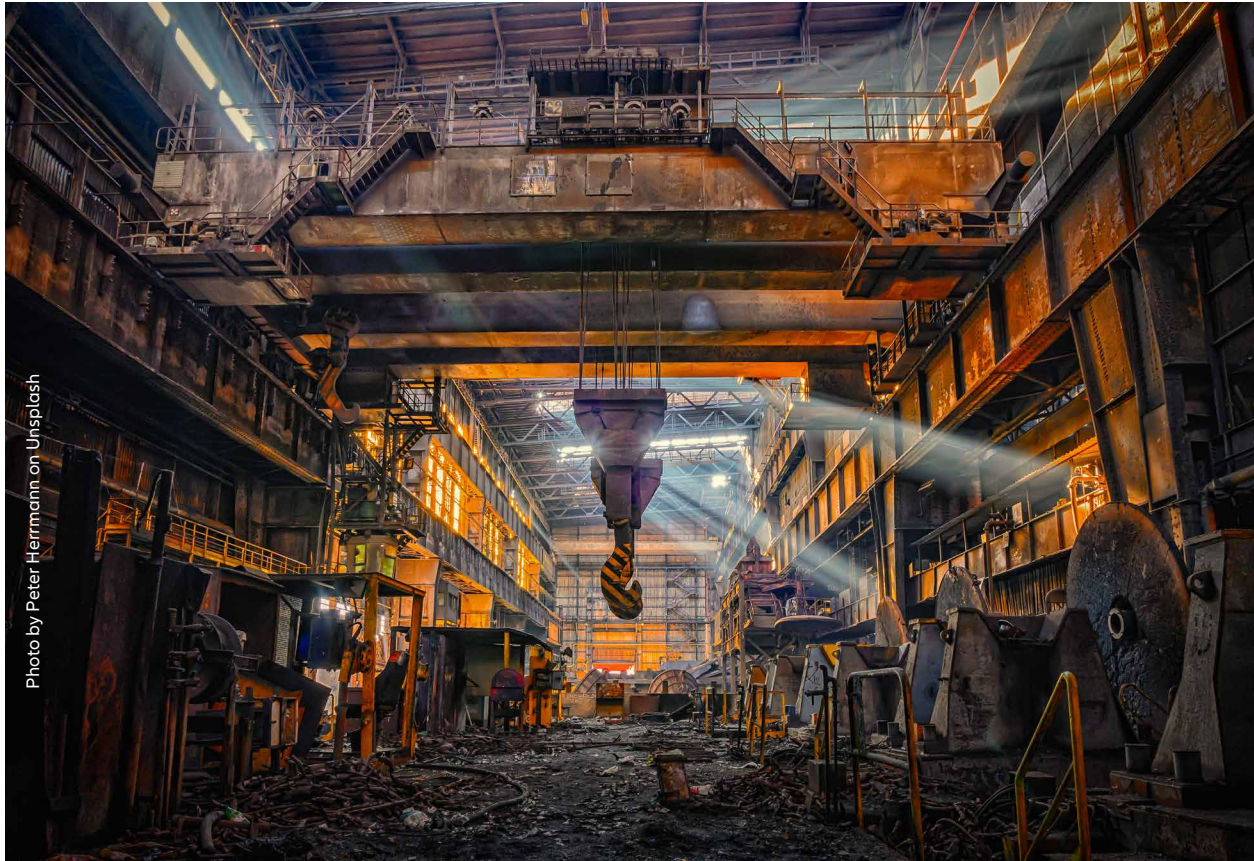


Photo by Peter Herrmann on Unsplash

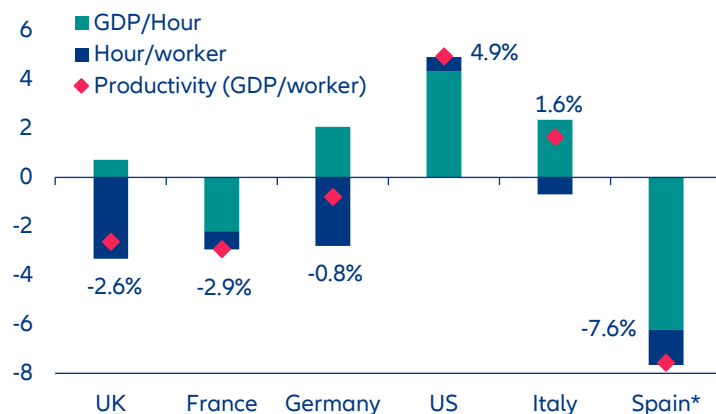
# Productivity: wide divergence across countries and regions since the pandemic

The US and Italy have seen remarkable growth in productivity, while other Eurozone economies lag behind. Productivity growth is still in the red in France, the UK and Spain relative to pre-pandemic levels (Figure 6). The decline in labor productivity (defined as GDP over employment) was relatively small in Germany but the US and Italy both recorded remarkable gains relative to their pre-pandemic trends. Between Q4 2019 and Q4 2022, labor productivity rose +4.9% and +1.6%, respectively. In both countries, this is the result of higher output produced per hour, while the number of hours worked per worker has increased only slightly in

the US and decreased meagerly in Italy. In contrast, in France and especially in Spain (where GDP is still below pre-pandemic levels), the level of productivity is sitting well below the Q4 2019 pre-pandemic trend, largely the result of lower output per hour, although the number of hours per worker has also declined. Meanwhile, in the UK, productivity losses are a byproduct of lower hours per worker, with output per worker having slightly improved.



Figure 6: Change in labor productivity between Q4 2019 and Q4 2022



Sources: Refinitiv, Allianz Research. Note that the latest available data for Spain are for Q3 2022.

**The slow reallocation of labor has resulted in sluggish productivity growth, or even outright losses, amid declining unemployment.** Until end-2020, labor markets adjusted to the Covid-19 crisis via reduced working hours rather than layoffs due to strong workers' rights and large fiscal support (Figure 7); the resulting rise in unemployment was lower than expected. As a result, labor productivity improved (since reduced labor input matched the decline of economic activity) but only temporarily before reverting to the long-term negative trend. This is consistent with the impact of previous crises, such as the 2008 global financial crisis and the European sovereign debt crisis when a significant adjustment in the labor market was due to reduced hours worked (Figure 8).

**At the same time, job creation has slowed in Germany, Italy and the US. In Italy and the US, depressed labor participation has hindered strong job gains.** The US has seen a rapid pick-up in early retirement while in Italy a large portion of disadvantaged groups exited the labor market during the crisis and are only gradually returning to work. Furthermore, in the US, immigration has slowed markedly while the country experienced 0.5mn excess deaths due to Covid-19. These factors have created a shortage of 3.5mn workers, according to the US Fed. In this environment of scarce labor, corporates have probably ramped up efficiency to make up for labor shortages.

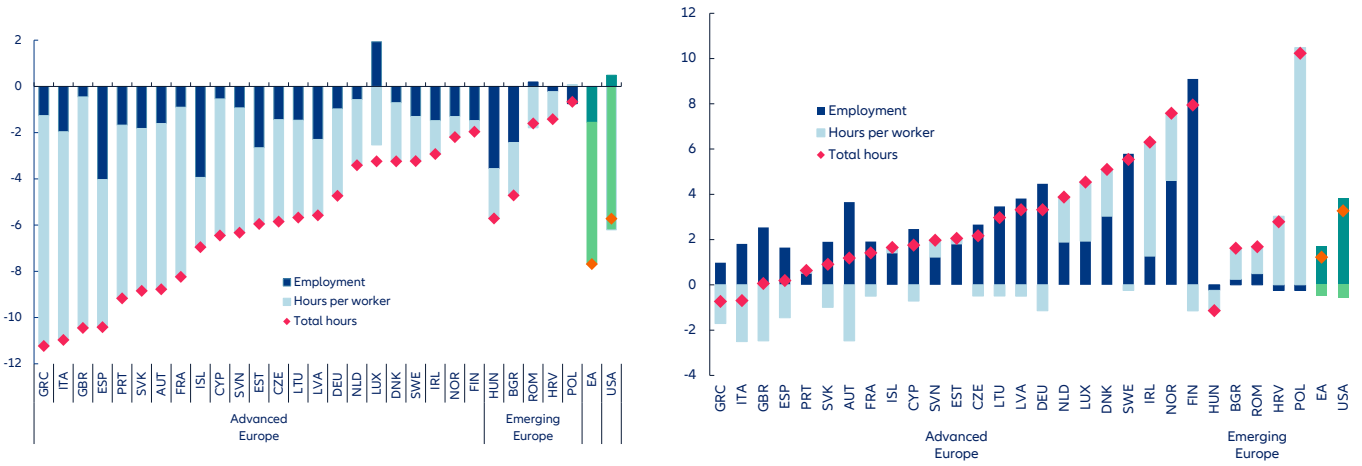
**In contrast, in France and Spain, labor participation and employment have increased strongly, reducing the need to increase efficiency and productivity.** The productivity underperformers France and Spain have both seen a rapid acceleration in job creation since 2021, especially among younger cohorts and

apprentices in the former. The employment rate for 15-24 years old has increased by +4.6pps between end-2019 and end-2022, against +2.0pps for the 25-49 age group and +3.1pps for the 50-64 cohort. Spain has seen strong employment growth among the younger cohorts but also among the older cohort – +6.5% and +10.3%, respectively. At the same time, employment growth for the 24-49 age group declined.

**Other relevant explanations of weak productivity growth (or outright losses) are related to the difficulty of implementing innovations after the pandemic or some labor re-organizations (eg. increased remote working for younger workers).** Finally, companies are increasingly aware that labor is set to remain a scarce resource amid deteriorating demographic trends, which has encouraged labor-hoarding strategies that have also weighed on productivity.

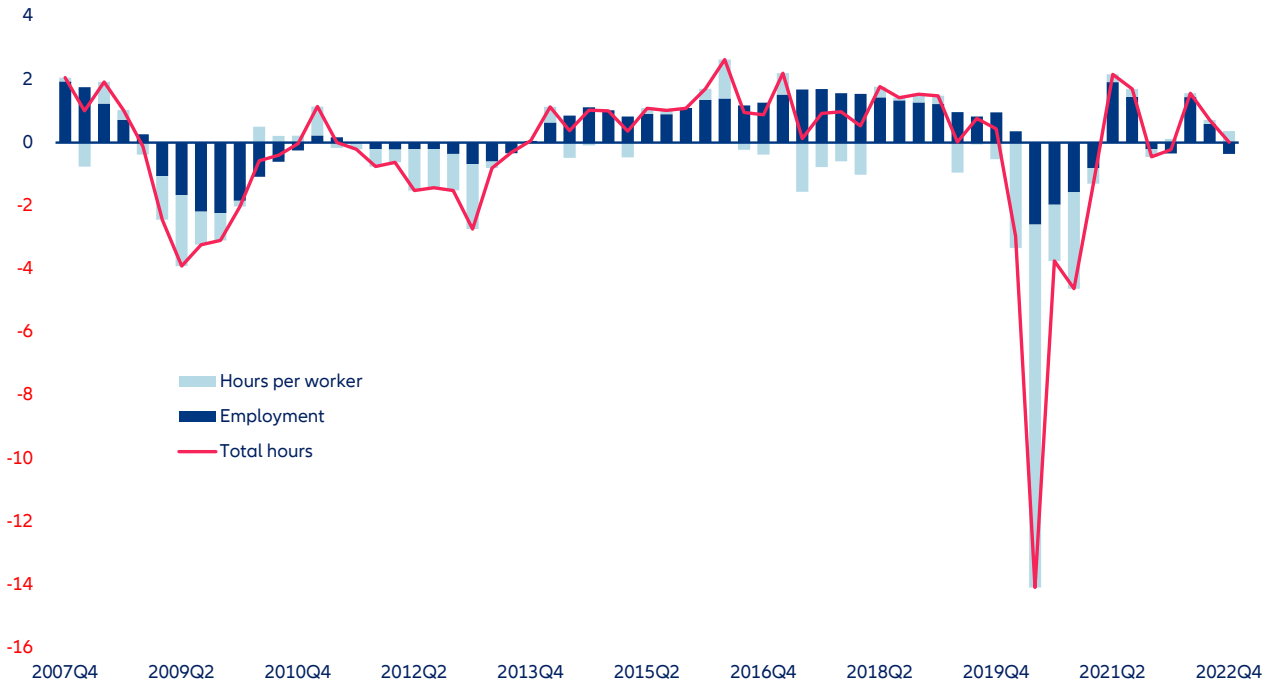
**The recovery in hours worked remains uneven and is likely to remain low due to stagnating growth (Figure 8).** The encouraging recovery in hours worked seen at the end of 2021 has not continued, especially in those countries that recorded a larger reduction at the onset of the pandemic. Progress in narrowing the gender gap in hours worked is also at risk because of the slowdown in the recovery.

Figure 7: Europe - Contributions to changes in total tours worked (2020 left chart, 2021 right chart), pps



Sources: Eurostat, ONS (UK), BLS (US), Allianz Research .

Figure 8: Europe - Contributions to changes in total tours worked (2020 left chart, 2021 right chart), pps



Sources: Eurostat, Allianz Research.

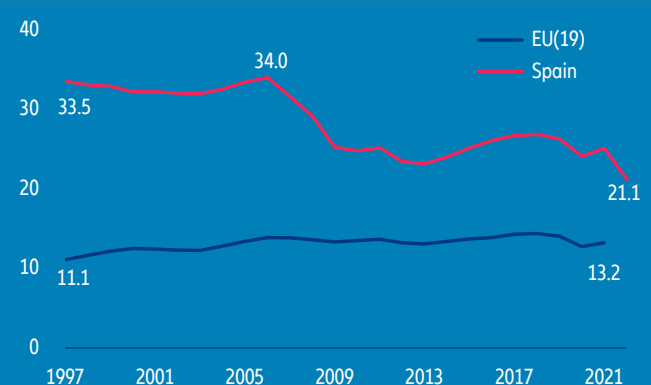
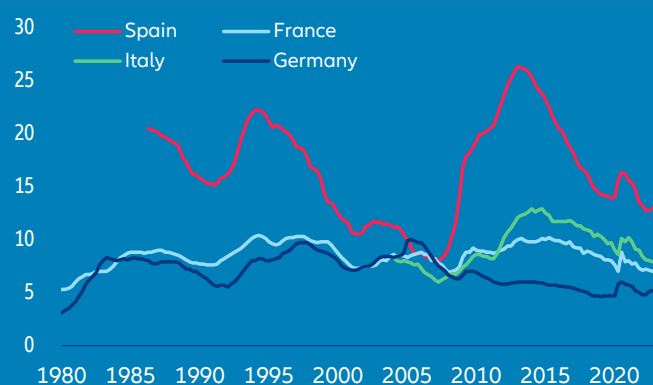
We do not expect productivity to recover its losses in the next 18 months in France and Spain. The weak growth environment that we expect through next year, combined with moderate increases in the unemployment rate, means that we do not expect much of a pick-up in French and Spanish productivity in the next 18 months. However, a modest recovery could start in 2024. Some industries such as automotive

and aerospace have retained their employees even as the level of production has not recovered. But as backlogs continue to ease, the levels of production and employment should adjust to pre-pandemic patterns. Prolonged weak economic growth should also prompt more companies to ditch labor-retention strategies while low productivity among the young cohorts hired since 2021 should start to gradually improve.

## Box 1: Spanish labor reform: tackling temporary work and its effects

Spain's labor market is generally known for its underperformance, characterized by high and persistent unemployment and temporary work above its main European competitors. In an effort to improve these market failures, several reforms have been introduced over the past decades.

Figure 1: Unemployment rate and temporary employment rate



Sources: Ameco, Eurostat, Allianz Research.

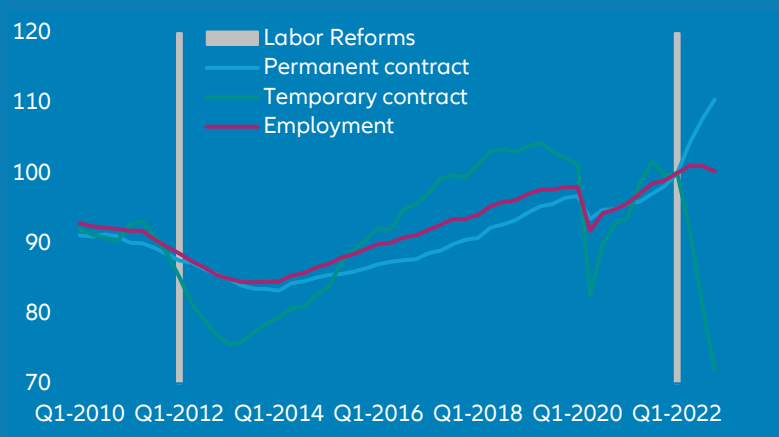
The most recent of these - the December 2021 Agreement, ratified by the Spanish Parliament in February 2022 - aims to reverse parts of the 2012 liberal reform - restoring some of the workers' rights lost in the past - and, above all, to address the problem of the high incidence of temporary work in the country. Unlike previous reforms, the latest one is the result of a tripartite agreement between the government, employers' organizations and trade unions, enhancing balance approaches and consensus on shared compromises. An important social gain that certainly helped to ensure a smooth transition process without major social disruptions.

To achieve its goal of promoting more stable employment, permanent contracts have been made the default option. This is certainly an important change, as previous labor laws were „neutral“ on the use of different types of employment contracts. But, at the same time, companies have been given the flexibility to adapt the workforce to changing circumstances - for example, they can reduce working hours or temporarily stop work<sup>1</sup>. Temporary contracts have also been simplified and the number of types reduced (previously there were several of them<sup>2</sup>) and the reform provides for stricter sanctions in case of violations in its use. It should be noted that the reform leaves open the possibility of temporary hiring when justified by, e.g. due to an expected or unexpected increase in activity, but seeks to make it more burdensome and thus discourage the use of very short-term contracts. For example, contracts of less than 30 months will be subject to increased social contributions. The reform also strengthened the role of collective bargaining at all levels (national, sectoral, company), as the new regulation allows a wide range of labor issues to be negotiated. For example, minimum wages will be removed from the list of categories in which the company agreement takes precedence over the industry agreement.

### Has the reform already paid off?

Labor market data indicate a significant change in the employment profile in 2022, with a robust increase in the number of permanent contracts (+13% vs Q4 2021) and a remarkable reduction in the number of temporary contracts (-24% vs. Q4 2021), which is positive and thus in line with the objectives of the reform (Figure 2).

Figure 2: Employment contract by type



Sources: INE, Refinitiv, Allianz Research.

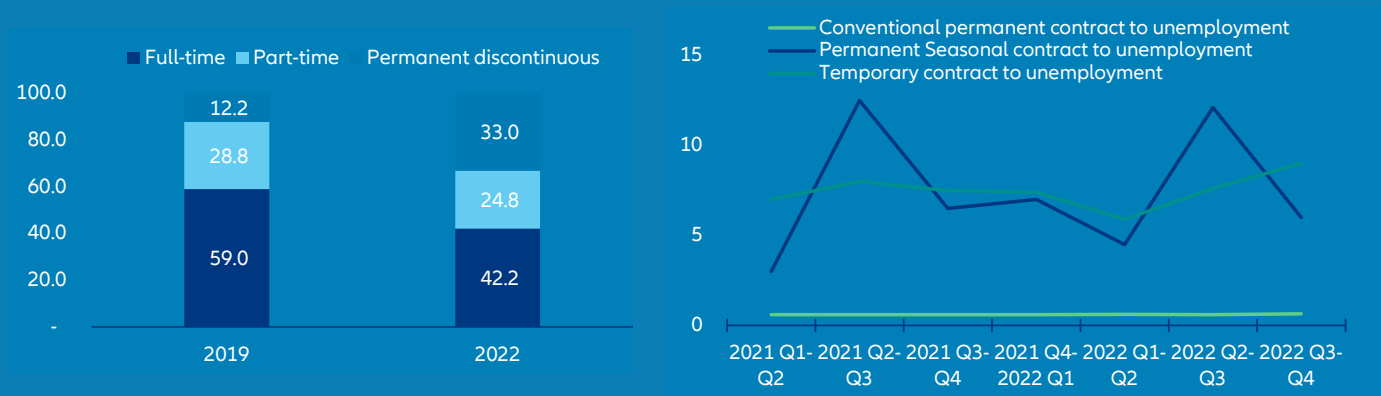
<sup>1</sup>This was inspired in the good experiences with the short-time working schemes (ERTES) agreed during the COVID-19.

<sup>2</sup>Specifically, besides training, apprenticeships and internships contracts concluded for a specific duration, only two other types of temporary contract will be allowed: either a contract to substitute for a worker who is temporarily absent, or a contract that is temporary because of occasional production circumstances.

However, a large part of this movement is explained by a certain reclassification of contracts: on the one hand, construction contracts that were previously considered temporary have now become permanent; on the other hand, many temporary contracts have become permanent discontinuous contracts. This latter shift is due to the disappearance of works and service contracts, as well as to greater restrictions on the use of temporary contracts, which have forced certain sectors to use this format because of their seasonality.

It should also be noted that this growth in permanent contracts has been accompanied by an increase in the share of permanent part-time and seasonal contracts, which in some cases may entail less job security (Figure 3). According to the Bank of Spain, social security data indicate that the transition rate to unemployment for workers with permanent seasonal contracts will increase by 2022 and will be similar to that of workers with temporary contracts in that year. Moreover, transitions to unemployment for workers with permanent seasonal contracts are similar to those for workers with temporary contracts. (Figure 3).

**Figure 3:** Permanent contracts by type & Quarterly transitions from employment to unemployment (% of number of workers)



Sources: Bank of Spain, Allianz Research.

This would suggest that temporary and permanent seasonal contracts are in fact quite similar, raising doubts about the effectiveness of the reform. However, other data suggest that this is not quite the case. Workers on seasonal contracts spent on average almost five years on their contracts (58 months), compared with only 22 months for those on temporary contracts. These figures suggest that workers on permanent seasonal contracts have greater job stability than those on temporary contracts (Bank of Spain).

All in all, while it is still too early to draw definitive conclusions about the reform and its impact on the functioning of the labor market, the data suggest that the last reform has created greater job security, which should have important implications for the pattern of private consumption – in line with the life cycle theory, household spending is inversely related to expected volatility in future income - and, consequently, for the Spanish economy in the coming years.



Photo by Markus Spiske on Unsplash

# Wage dynamics: The drivers of growth

**Could sticky inflation put further pressures on wages in the Eurozone?** The solid post-pandemic rebound, together with rising energy prices in the wake of the Russian invasion of Ukraine, led to the 2021-22 inflation surge and raised fears of a price-wage spiral. When looking at what is driving wage pressures across the main Eurozone economies, we find that past inflation has a higher explanatory power for wage changes in the peripheral countries – i.e. Italy and Spain (around 0.4pp) – than in the core countries – i.e. France and Germany (around 0.2pp). The lagged inflation effect is also higher in these countries. Specifically, our model suggests that the previous year's inflation (four lags) significantly influences wage changes in the current period for Italy and Spain, while for France and Germany the more recent inflation figures – one to two quarters ahead – play a more important role. This probably reflects the influence of unions in wage bargaining in peripheral countries, where negotiations take time and gradual wage increases

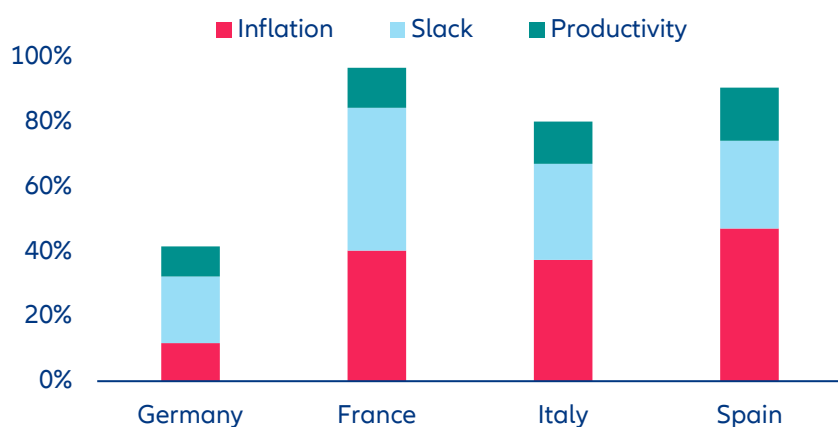
(lower than current inflation) are often preferred in exchange for job security (this is particularly the case for Spain in 2022). This also suggests that the contribution of inflation to wage growth in 2023 is likely to be more pronounced in Spain and Italy than in the core countries even as headline inflation has slowed down.

**Productivity gains have a larger impact on wage changes in Italy and Spain (around 0.7pp) than in the core countries of France and Germany (around 0.3pp).** As a result, the falling labor productivity trends suggest downward pressure on future wage bargaining. In the same vein, weaker economic prospects in the medium term for the four countries point to a relative increase in the unemployment rate and/or labor participation rate, which should also limit wage increases this year. Without considering previous wage growth, we find that productivity has the largest impact on wage variation, followed by inflation and then the measure of labor

market slack for all countries. However, the selected slack measure plays a critical role in France.

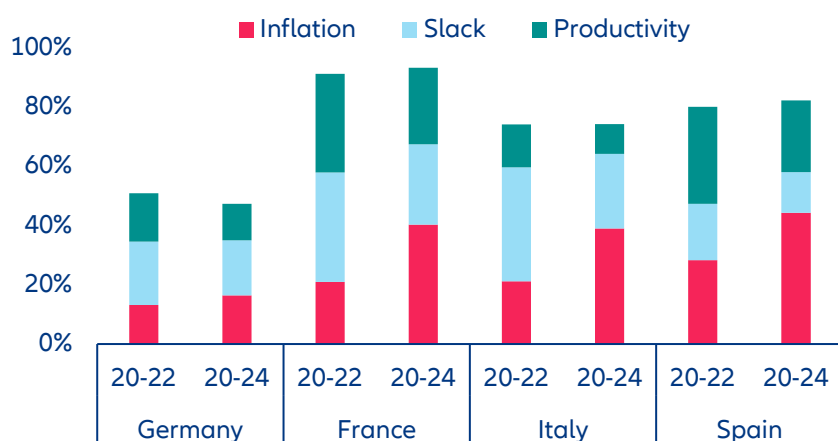
Overall, we expect average wage growth of 5% in Germany, 4.6% in Spain, 4.5% in Italy and 4.1% in France this year (Figure 11). Our model suggests that there should be some moderate wage increases in the periphery over the next two years, mainly driven by the high inflation of the past<sup>3</sup>. While this is likely to affect core inflation, the ECB's interest rate hikes and expectations of low economic growth will weigh on demand, reducing the likelihood of further wage and price pressures. We expect the wage-price spiral to be somewhat contained and temporary.

Figure 9: Wage growth model: average contribution by component (beginning of sample until 2019)



Source: Allianz Research.

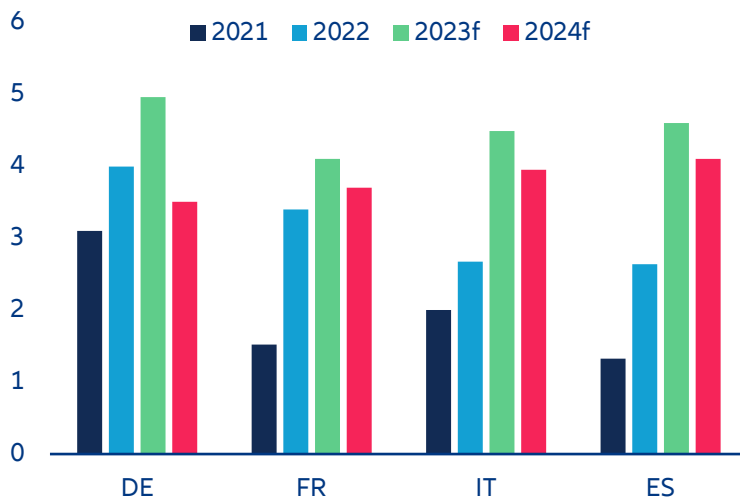
Figure 10: Wage growth model: average contribution by component (post Covid-2019)



Sources: Allianz Research. Note: 20-24 consider our forecasts for wage growth in 2023-2024.

<sup>3</sup>Our model explains (on average for the four countries) 50% of wage growth. Features not captured by the model may, for example, be related to the strength/length of collective agreements. Moreover, as the ECB has recently noted, the staggered, infrequent and decentralized nature of wage setting means that it is likely to take several years for wages to fully adjust to the surprise price inflation that has already occurred. Hence, our final wage forecasts combine the model results and country-specific analysis.

Figure 11: EZ Big 4 - Wage growth dynamics



Sources: Allianz Research.

Table 1: Wage growth forecasts

	2021	2022	2023f	2024f
DE	3.1	4.0	5.0	3.5
FR	1.5	3.4	4.1	3.7
IT	2.0	2.7	4.5	4.0
ES	1.3	2.6	4.6	4.1

Sources: Allianz Research. Forecasts are based on the current model-based estimate and the recent economic outlook forecast until end-2024..

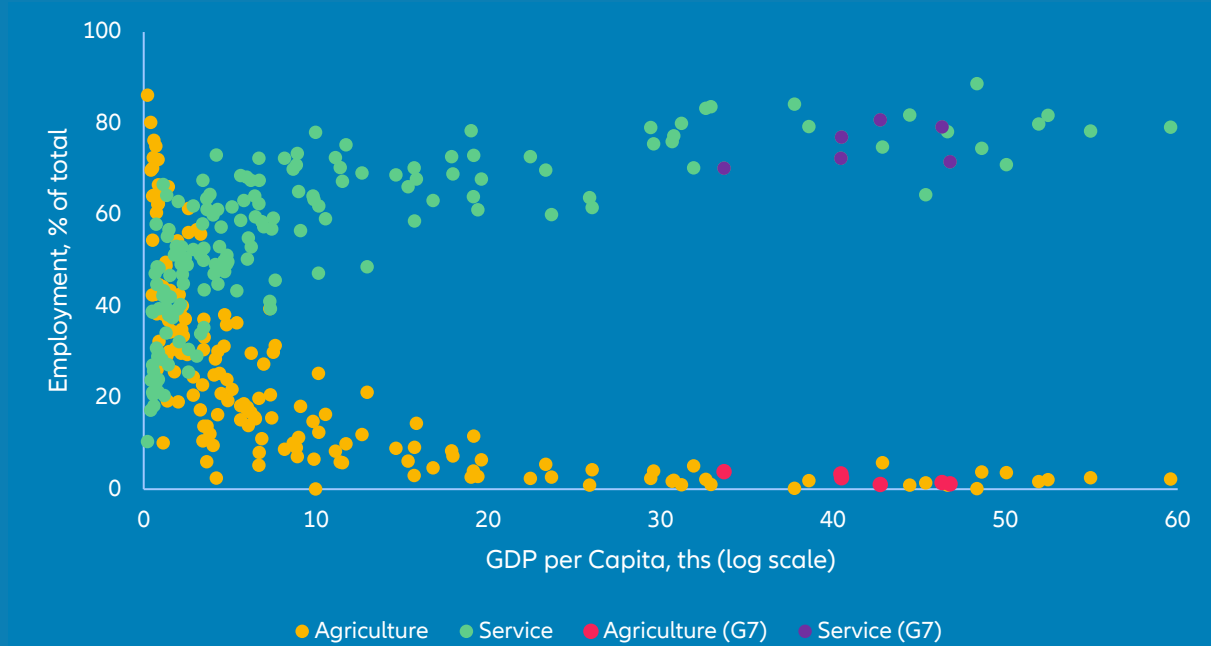


## Box 2: How will artificial intelligence (AI) disrupt labor markets?

While wage pressures remain high in the wake of post-pandemic labor scarcity, new technologies could permanently diminish wage bargaining power and, thus, could counteract skills shortages. Recent research from OpenAI (the creator of ChatGPT) finds that nearly one in four US workers may see at least half of their work impacted by the introduction of large language models (LLMs). Similarly, a report by Goldman Sachs concluded that 300mn jobs globally could be affected by the adoption of LLMs—there is a clear risk of job displacement depending on the rate of adoption, which is influenced by reliability, regulation, and the organization of labor markets.

Labor-saving technological advances could be antidote to labor scarcity in aging societies but have rarely been distributed to prosperity across income groups. Job displacement could be blessing in disguise in countries with a shrinking workforce due to rapidly aging populations, especially in China, many European countries, and Japan. However, past evidence suggests that low-skilled workers stand to lose from technological advances. For instance, innovation in agriculture led to almost no benefits for workers in the sector, while industrialization took craft work out of homes and into factories with increased surveillance from managers, decreased pay and longer hours (Figure 1).

Figure 1: Global employment and standard of living comparison

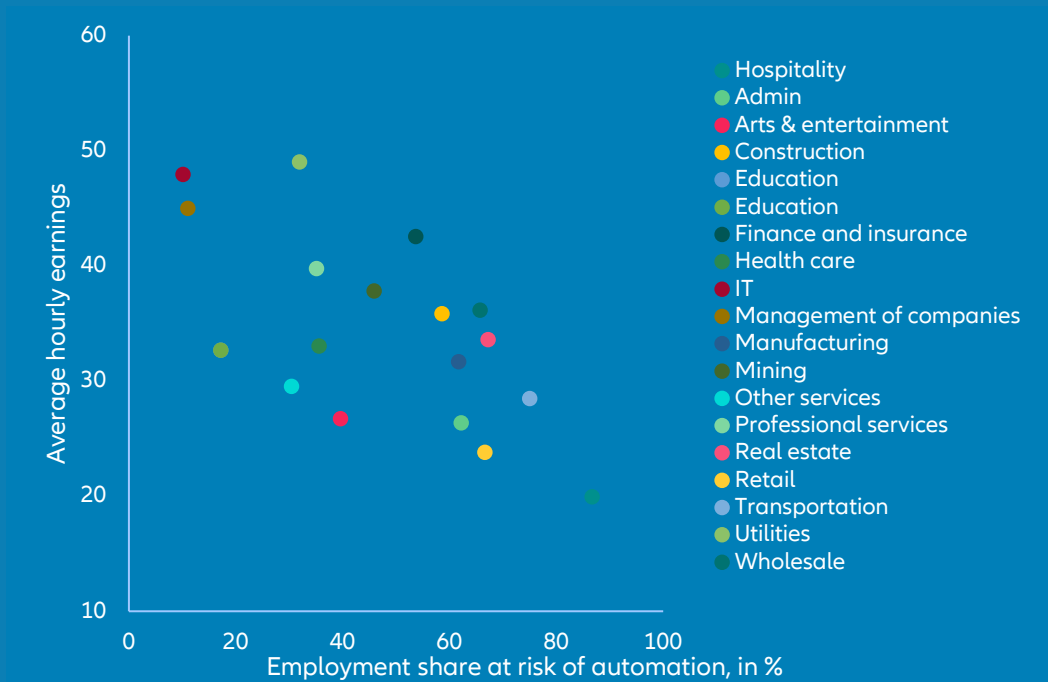


Sources: Bank of Spain, Allianz Research.

Increasing automation will change the types of skills that employers demand and the relationships between employers and workers—and this time, it might affect mostly highly-skilled workers (who traditionally benefitted from technical advances) through three main channels:

- Changing the types of skills that employers demand. Labor markets are already polarizing as machines are replacing manufacturing or office workers. This benefits workers that either have the skills to use technology productively, or have skills that technology cannot replace (e.g. creativity, social skills and management), deepening inequality as others see wages stagnate or jobs displaced.
- Displacing labor as digital technology gets 'smarter'. In an extreme scenario of unabashed technological progress, many occupations might be automated away and job losses will be significant. However, a more nuanced view suggests that most occupations are likely to be transformed rather than automated. The impact of technological transformation will depend on the degree of adoption and tasks. For robotics, the impact will be more in manufacturing, whereas for AI, risks are higher in the information, professional services, management and finance sectors, and to a lesser extent also in retail trade, transportation and utilities.
- Disrupting traditional relationships between employers and workers. New forms of work (e.g. the 'gig economy' or the 'Uberization of work') have emerged, which de-link employers from workers and often anonymize them, making them fungible. Many social security benefits are linked to traditional employment arrangements; workers may therefore lose many benefits and protections.

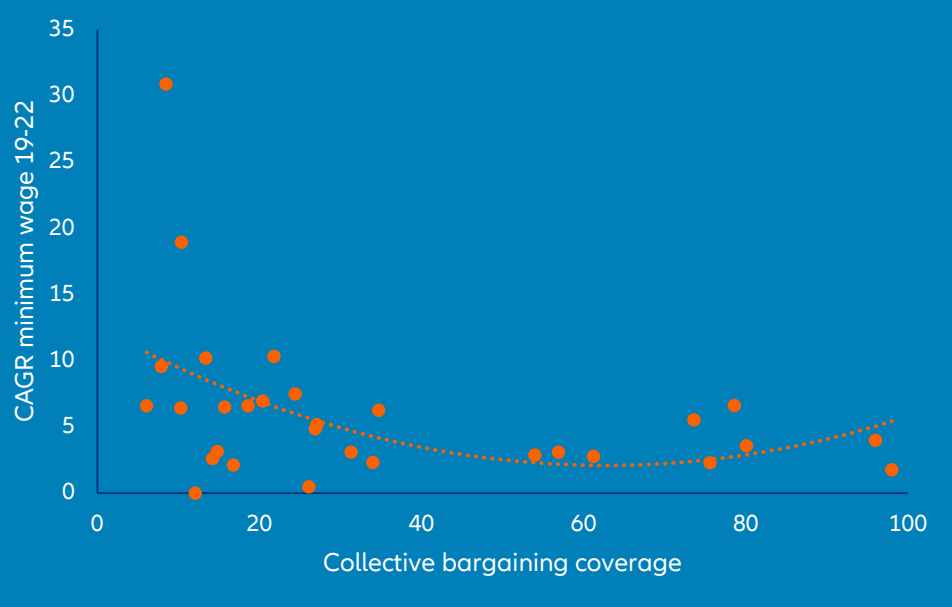
Figure 2: US jobs at risk of automation



Sources: Refinitiv Datastream.

The impact that AI could have on wages can be mitigated by increasing workers' bargaining power. Countries better positioned to integrate new technologies in the workplace without causing social dislocations are those that have stronger trade unions or higher rates of collective-bargaining coverage (percentage of employees covered by valid collective agreements in force). However, new technologies can also bring opportunities for growth and prosperity by improving labor productivity, lowering transaction costs and reducing barriers to market entry. This will in turn accelerate innovation, inducing a virtuous circle of growth and productivity gains, creating new jobs and occupations.<sup>4</sup>

Figure 3: Average growth of minimum wage since 2019 and collective bargaining coverage, in %



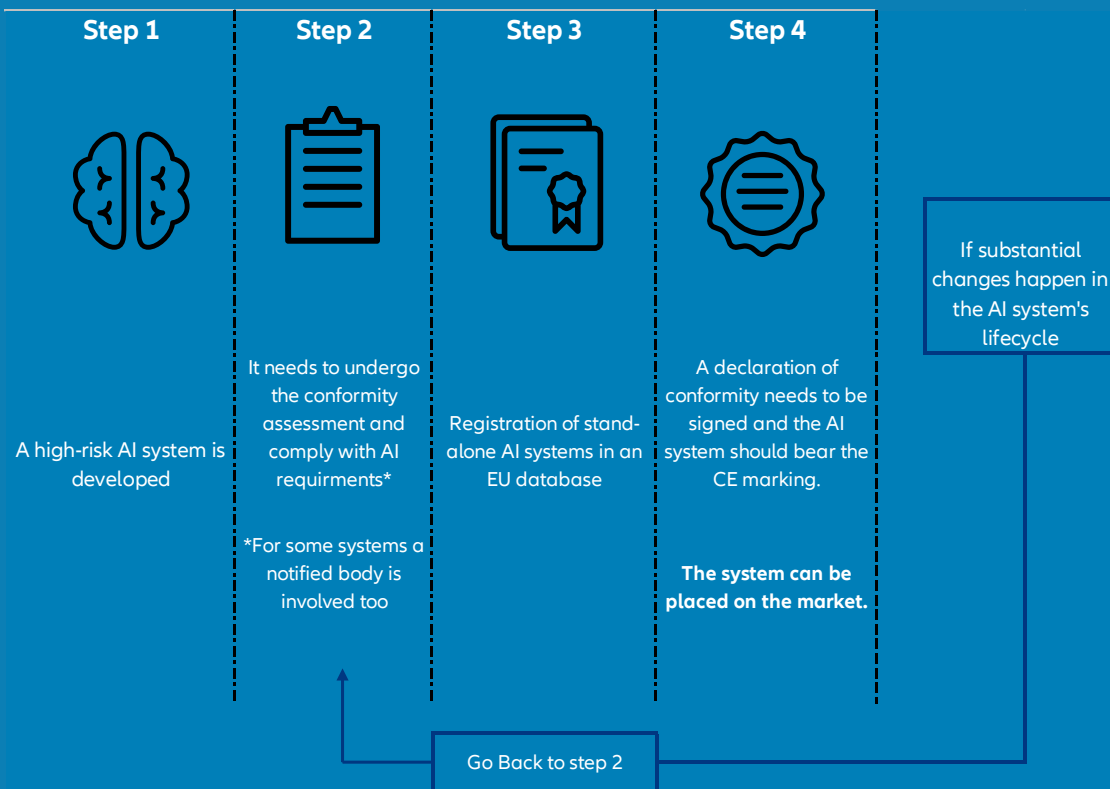
Sources: OECD, Allianz Research.

<sup>4</sup> For example, advances in electricity generation and distribution in the 19th-20th Centuries put most candle or gaslight makers out of business. But it allowed elevators (reshaping urban geography), safe lighting (allowing longer work hours), and powered newer machines (increasing productivity) and telecommunications (enabling globalization). These changes transformed and increased economic growth and job creation. A cadre of skilled electrical workers emerged to install, operate, and maintain these systems safely. Now new storage technologies could reshape transport (electric cars). The brief history of the internet is filled with new occupations (e.g., mobile apps developers, webmasters, cybersecurity specialist, bloggers). There is no reason to think that these drivers-and others-will not continue to play a role in job creation in the digitalized economy.

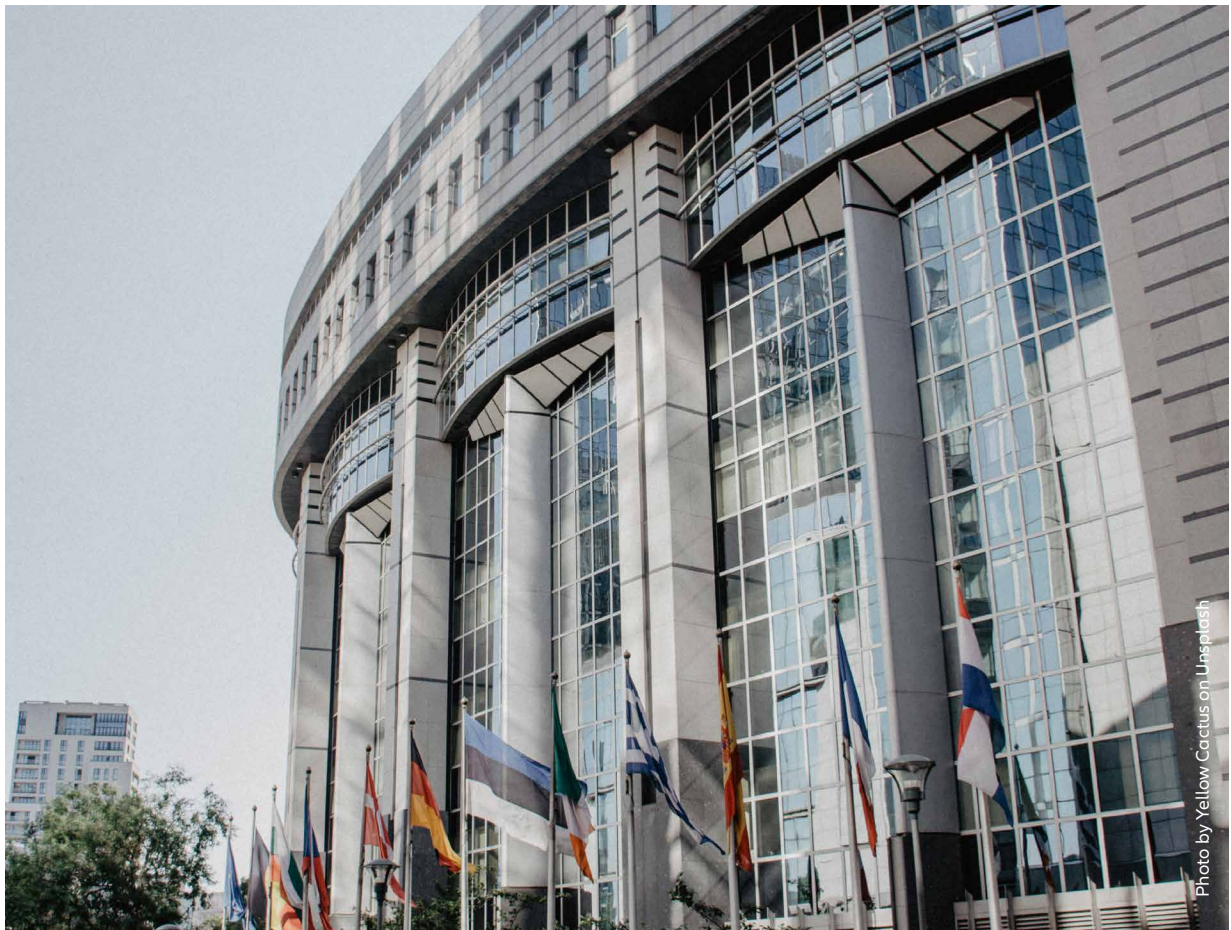
Labor market policies need to focus on up- and reskilling to tackle the challenges from AI. Reskilling has already successfully enabled credit analysts to become data analysts, or workers in the fossil fuel industry to transfer their expertise to renewable energy generation, especially in areas of adaptive skills (and close occupational proximity). For instance, reskilling of an accountant clerk to a cybersecurity officer currently takes approximately six months.

The current policy discussion on digitalization, and in particular AI, underscores the importance of a multi-stakeholder approach. The European Commission has proposed a risk-based legal framework for AI that defines four levels of risk from minimal to unacceptable. As AI is an evolving technology, regulation has to be equally agile in adapting to the changes and becoming future proof. The private sector has also put forward topline recommendations for regulating AI, which also includes taking a sectoral approach, promoting an interoperable approach to AI standards and governance, ensuring parity in expectations between non-AI and AI systems and promoting accountability.

Figure 4: European Commission process proposal to regulation of AI systems



Source: European Commission.



# What does this mean for policy makers

To address the cyclical pressures (and mitigate the risk of an adverse wage-price loop), policies need to be aimed at adjusting crisis-support measures to encourage a more flexible labor market while protecting the vulnerable. More specifically, this would include pivoting job-retention schemes towards sectors that are still struggling in the wake of pandemic-related restrictions and are disproportionately affected by higher energy prices, including reducing permanent dependence through proper incentives. In addition, active labor market policies would facilitate job-to-job transitions through higher labor and product-market efficiency as well as re-/upskilling. In this context, minimizing potential scarring would require public support for (re-)joining of the labor force and incentivize hiring/mobility, ideally in combination with a re-thinking of social protection.

At the same time, structural pressures in the digital economy are becoming more prominent. Over the last decades, the labor share of income has steadily declined due to technological change, globalization, the rise of “superstar firms” and the compositional shift in employment from labor-intensive to capital-intensive. Added to this are the lower increases of minimum wages relative to median wages, declining unionization and associated bargaining power and the privatization of state-owned enterprises.<sup>5</sup>

<sup>5</sup> Autor, David, David Dorn, Lawrence F Katz, Christina Patterson, John Van Reenen, 2020, “Fall of the Labor Share and the Rise of Superstar Firms,” *The Quarterly Journal of Economics*, Vol. 135, No. 2, pp. 645–709.

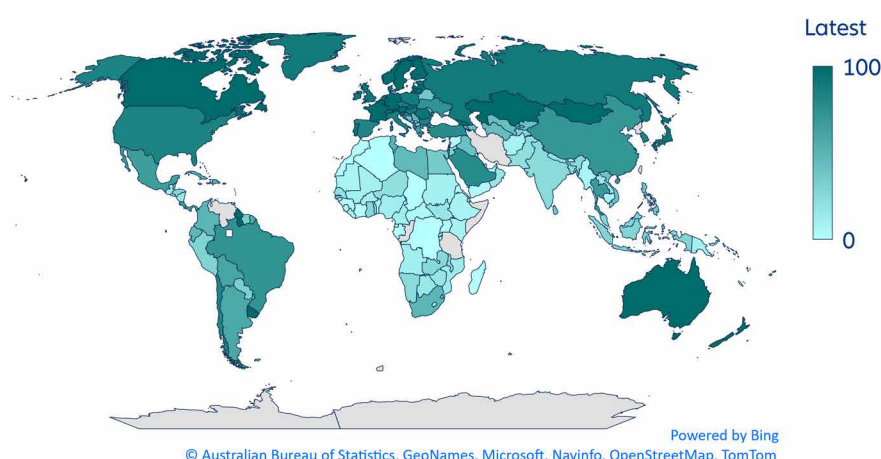
Changing business practices and technological progress have already had an unbalanced impact on labor productivity across sectors and its impact on incomes. Thus, the central public policy concern around jobs is about how they could unlock opportunities for higher growth while protecting poorer, low-skilled segments of the workforce (which tend to hold jobs that are more likely to be automatized). At the same time, AI threatens better-skilled, higher-earning workers, who have traditionally benefitted from greater digitalization. Public policies could position countries better to mitigate the threats and take maximum advantage of the opportunities. Key measures include:

- Overcome existing divides by addressing bottlenecks in technology access. Address regulatory and market failures that hold back the diffusion of the Internet, electronic payment systems and low-cost devices. Specific attention will be needed to increase the participation of women, the poor and rural communities in the digital economy.
- Build skills for the workforce of the future. Education systems need reforms to impart the skills needed to

participate in a global digital economy. ‘Bridging’ from education to employment could help close some skills gaps. Additional outreach is required so that women and people with disabilities – who can gain from online work or learning opportunities – are not excluded.

- Invest in analog complements and boost social protection. The rise of non-standard work (meaning part-time, temporary or freelance contracts) could pose a challenge if it entails a loss of social protection. Social safety nets would need reforms to protect ‘gig’ workers and to support those who lose their jobs or need transition assistance. Wage gaps, pension gaps and job quality will continue to impact social protection – not to mention that this is aggravated when it intersects with gender, ethnicity or immigration status. The relevant question is not whether social protection should have a different scope, but rather whether it should be linked to employment status as it has been previously. If the future is one of little work, cash transfers and universal basic income schemes – currently being piloted in Finland – may need to be developed. Technology can help deliver these complements, e.g. through digital financial services and mobile government services.

**Figure 12:** Proportion of population covered by social protection floors/systems, in %



Sources: ILO, Allianz Research.

## Appendix: Econometric results

For each country specifically, the empirical approach can be described as follows<sup>6</sup>:

$$\Delta w_t = \alpha + \beta_1 \Delta w_{t-1} + \beta_2 \Delta CPI_{t-p} + \beta_3 \Delta slack_{t-p} + \beta_4 \Delta productivity_{t-p} + \varepsilon_{i,t}$$

For  $t = 1, \dots, T$  and  $p = 1, \dots, P$ .

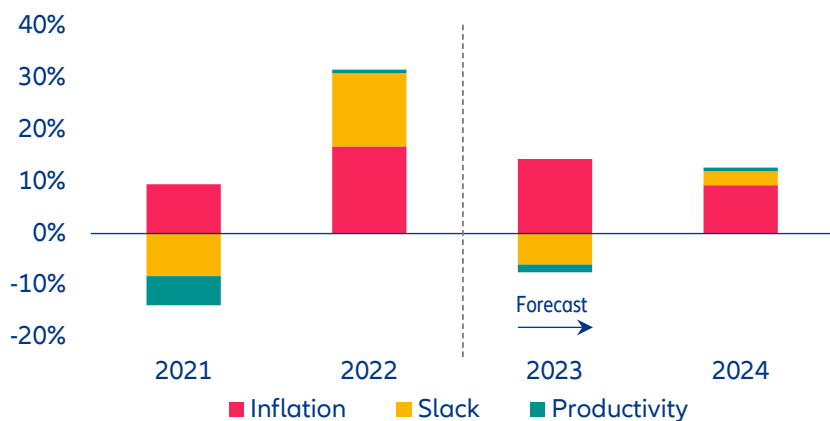
Where  $T$  is the number of periods and  $P$  the number of lags.  $\Delta w_t$  is the variation of the log wage in relation to the previous quarter,  $\Delta CPI_t$  is the variation of log inflation in relation the previous quarter,  $\Delta slack_t$  is either unemployment rate or labor force participation,  $\Delta productivity_t$  is the log of labor productivity.  $(\beta_1, \dots, \beta_4)$  are the slope coefficients,  $\alpha$  is the intercept and  $\varepsilon_t$  is the residual. The model is estimated on a quarterly basis from Q2 1997 to Q4 2022 for Germany, France and Spain. For Italy, the sample starts only in Q1 1998. Results and contributions to growth are shown in the Appendix.

Variable	Lag	Germany	France	Italy	Spain
<b>Wage</b>					
	1	-0.763*** (0.08)		-0.390*** -0.064	
	2	-0.460*** (0.113)			
	3	-0.367*** (0.107)			
	4				
<b>Inflation</b>					
	1	0.219** (0.142)	0.162** (0.068)		
	2		0.211** (0.095)		
	3				0.148** -0.066
	4			0.664* (0.352)	0.394*** (0.079)
<b>Slack</b>					
	0		-0.753*** (0.169)		-0.2782** (0.131)
	1				
	2				
	3	-0.112*** -0.03		-0.071* (0.041)	
<b>Productivity</b>					
	1				0.630*** (0.223)
	2				
	3		0.340*** (0.055)		
	4	0.349** (0.135)		0.909* (0.492)	
Adjusted-R <sup>2</sup>		59%	56%	46%	52%
No. of obs		107	107	100	107

Source: Allianz Research. Standard errors are heteroskedasticity and autocorrelation consistent and are showed in parenthesis. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . For reasons of space and simplicity, we report the main results for each country. Econometric details are available on request.

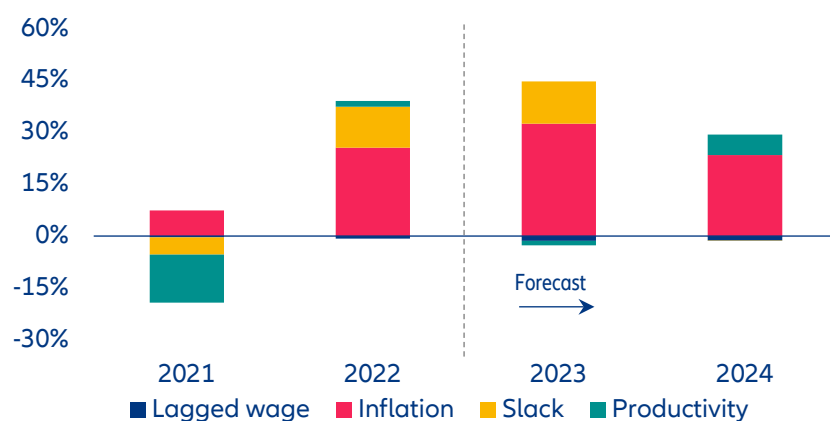
<sup>6</sup>Specifically, we estimate an Autoregressive Distributed Lag Model (ADL), which assumes that a time series  $Y_t$  can be represented by a linear function of  $p$  of its lagged values and  $q$  lags of another time series  $X_t$ . For each model, we tested all possible combinations to define the best lag structure for the selection of each variable. We select only those models with at least 10% significance in the maximum lag of each variable. Note that, in line with the literature, we control for the expected long-run effect of inflation and productivity, which are considered to be the main determinants of wage growth in the long run. Finally, the final selection of the best model is made on the basis of the Akaike information criterion. We also corrected by autocorrelation in the residuals and included a Covid-19 dummy.

Figure A1: Germany: Contributions to QoQ% Wage growth model



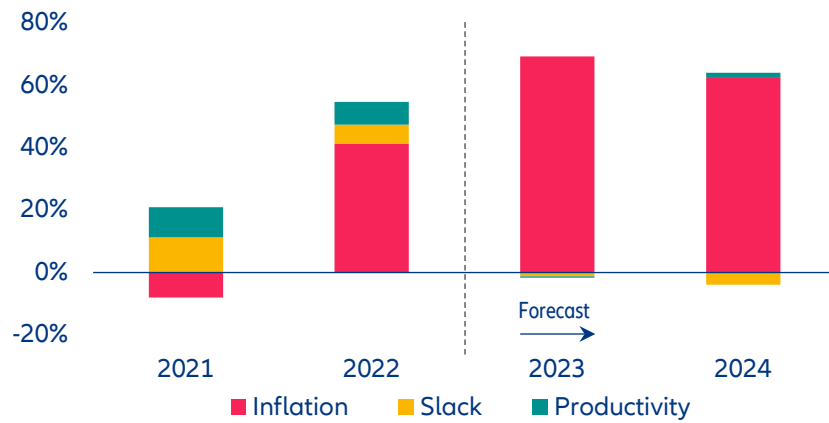
Sources: Refinitiv, Allianz Research..

Figure A2: France: Contributions to QoQ% Wage growth model



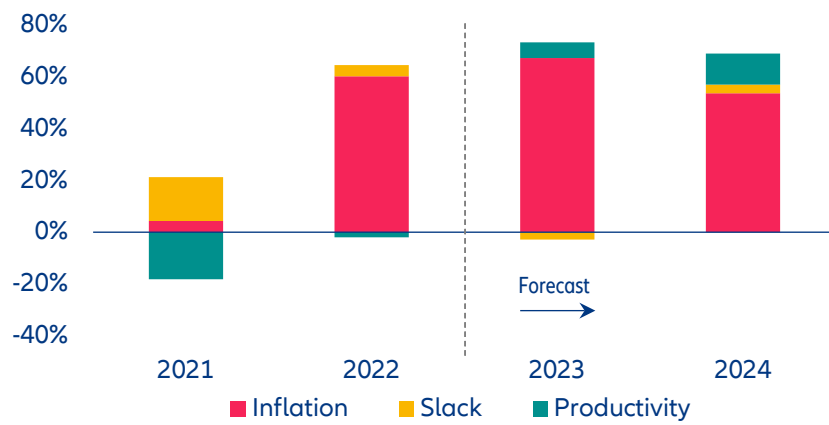
Sources: Refinitiv, Allianz Research..

Figure A3: Italy: Contributions to QoQ% Wage growth model



Sources: Refinitiv, Allianz Research..

Figure A4: Spain: Contributions to QoQ% Wage growth model



Sources: Refinitiv, Allianz Research.





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