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The decoupling between labour compensation and productivity in high-income countries: Why is the nexus broken?

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Abstract

During the last decades, mature economies have tended to experience a divergence between labour compensation and productivity growth. Interpretations of this trend are still under debate. Our article aims at contributing to a sound, evidence-based understanding. We estimate the magnitude of this decoupling for a panel of 22 high-income economies (1970–2018) and empirically assess the role of a variety of factors. After providing evidence that casts doubt on the impact of technical change, we adopt a 'political economy' standpoint and focus on the structural effects on real compensation growth of several macroeconomic and institutional dimensions. Our findings indicate that labour market slack and the weakening of pro-labour institutions have acted as important wage-squeezing factors. A negative effect is also found for trade openness and international capital mobility, while most financialization variables are not significant. The robustness of our results is supported by a range of tests and specifications.

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1 | BACKGROUND AND MOTIVATION

There is clear evidence that in the immediate post-war period in most industrial countries the average (and the median) labour compensation tended to move in step with productivity growth. Since the late 1970s or beginning of the 1980s this pattern has broken, and what is observed in mature economies (albeit to differing degrees and with somewhat different timings) is a decoupling between the average pay and productivity (Bivens and Mishel, 2015; Stansbury and Summers, 2017; Schwellnus et al., 2018; Greenspon et al., 2021; Mishel and Bivens, 2021a; Sharpe and Ashwell, 2021). While there is a consensus among economists about the general trend, which is acknowledged also by major international institutions (IMF, 2007a; European Commission, 2007; ILO, 2012, 2014; OECD, 2012, 2015), there is an ongoing debate about the causes behind the divergence of compensation from labour productivity.[1] The topic is central to a range of socioeconomic issues as the erosion of the labour share (a way to observe the decoupling between the average compensation and labour productivity), in addition to being related to personal income inequality (Atkinson, 2009; Glyn, 2009; Jacobson and Occhino, 2012), may have important macroeconomic consequences.[2] For these reasons, it also deserves attention for its public policy implications (OECD, 2018).

The interpretation of these trends began to gain momentum in the United States at the dawn of the new millennium and subsequently attracted a growing number of contributors from different schools of thought. At the moment, there is no consensus view emerging from the literature. The subject has been analysed from different theoretical perspectives, each covering and discussing a variety of factors, and empirical results are often mixed.

We aim to contribute to this debate, after a thorough review of the literature, by means of a careful empirical assessment involving a panel of 22 OECD mature economies over the 1970–2018 time span. In this way, we aim to detect general trends and factors, whereas previous analyses of the decoupling have most often focused on specific country experiences. After providing estimates of the (average) size of the decoupling, we proceed to systematically test the impact of a plurality of variables belonging to each of the several dimensions that are discussed in the literature—technical innovation, labour market slack, labour market institutions, globalization, financialization—, and we select them for inclusion in a general model on the basis of their statistical and economic significance. In this way, we obtain results that are robust to several specifications and additional tests. The results support the 'political economy' approach to the interpretation of this decoupling and provide an assessment of the weight of a variety of institutional and macroeconomic factors in affecting the growth of labour compensation and its decoupling from productivity growth.

Overall, there are two opposing approaches to interpreting the trends in the pay-productivity nexus in the post-war period.[3] The neoclassical perspective expects relative stability of income shares owing to 'well-behaved' factor substitutability and the associated tendency of wages to vary in line with labour (marginal) productivity. Thus, since the pre-1970s phase seems to fit its expectations, it is the decoupling phase (post-1970s) that it considers to merit inquiry. By contrast, the political economy approach sees income distribution as essentially determined by bargaining power and social norms and thus sees no necessary mechanical link between pay and productivity, although an increase in the latter may, of course, enable a labour compensation growth that does not encroach on established profitability and only affects the distribution of productivity gains. From this point of view, both phases can be explained by specific institutional arrangements (Levy and Temin, 2007; Glyn, 2007; Kristal, 2010). The focus of the present discussion will be, however, on the decoupling phase.

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The most common explanation of the decoupling between productivity and pay is framed in a neoclassical perspective and relates to the impact on relative factor scarcity of particular forms of technical change or, to a lesser extent, of international trade. Other lines of inquiry emphasize the essentially institutional and conflict-driven nature of income distribution, even in competitive conditions, and focus on the processes of macroeconomic and institutional change. In this regard, a variety of dimensions are taken into account as wage-moderating factors.[4] It is within this (broadly defined) political economy approach to income distribution that we situate our research. Specifically, first, we confirm the decoupling and estimate its size; second, after assessing the effects of technical change, we investigate the role of a set of macroeconomic and institutional dimensions in influencing the rate of growth of the average labour compensation (in real terms) and assess their impact on the pay-productivity divergence.

As mentioned, one main element of novelty in our work consists of making use of longitudinal data that allow us to investigate the average behaviour of the compensation–productivity link and the common factors behind a common tendency in income distribution in mature countries (in our robustness tests we will however also address the issue of spatial heterogeneity). Previous contributions present country-level surveys, while we aim to offer a wider exploration by targeting an extended set of mature economies. Moreover, we use a plurality of indicators for each macroeconomic and institutional dimension. A further distinguishing feature of our approach is that we systematically include among our explanatory variables the unemployment rate or other indicators of slack in the labour market. We do so because, contrary to prevailing macroeconomic models, we do not assume that there is a tendency of the economy to return to 'equilibrium' unemployment, understood as an attractor for the economic system, and we believe that insufficient aggregate demand may cause persistent labour market slack, which in turn can affect workers' bargaining power.[5] In addition, we focus on the 'structural' effects (by averaging over the cycle) of institutional and macroeconomic factors, as their impact on the workers' relative bargaining strength is likely to take time to develop. We complete the analysis by empirically assessing the interaction between some of the selected variables and productivity growth to obtain measures of 'state-dependent' decoupling. As a further check, we estimate our model by taking the compensation-productivity gap as our dependent variable. This procedure, together with some methodological refinements adopted in our empirical analysis, improves the reliability of our results.

Of course, our study also relates to the literature on the determinants of the (decline in the) labour share. Compared to this research, however, our analysis has a distinctive element in that we treat the growth rate of productivity and that of compensation separately. We consider this methodology useful because the labour share is simultaneously affected by two distinct variables (i.e. labour productivity and pay), and this may have otherwise introduced some confounding elements into the analysis.[6]

The article proceeds as follows. In Section 2, we review the empirical literature on the decoupling between labour productivity and pay. In Section 3, we focus on the main explanations for this phenomenon. In Section 4, we introduce and discuss the set of dimensions and indicators to which our empirical exploration refers. We then turn to the empirical analysis: Section 5 introduces the data and methodology, while Section 6 is devoted to the findings and a discussion. Section 7 summarizes and concludes.

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2 | THE DECOUPLING OF PAY AND PRODUCTIVITY: A BIRD'S-EYE LITERATURE REVIEW

Before reviewing the most recent empirical studies, some clarification is needed about the measurement of compensation. The applied research often focuses on the decoupling of the *median* compensation from labour productivity. This decoupling reflects, and can be broken down into (i) the decoupling of the average compensation (in real terms) from productivity, and (ii) the divergence between the *average* and *median* compensation. As we target a large number of countries over a long period (1970–2018), our exploration refers exclusively to the first component for data availability reasons. This means that our research does not consider the issue of wage inequality.[7] As there is increasing inequality within the labour force, particularly in favour of top-managerial incomes, as is well documented (Atkinson et al., 2011; Piketty, 2014), and particularly marked in the United States (Piketty and Saez, 2003; Mishel and Bivens, 2021a), our empirical results tend to *underestimate* the decoupling of a typical worker's pay from productivity and also the general redistribution of income away from labour, as the very large and increasing compensation of top managers could legitimately be regarded not as rewarding their (skilled) labour but as the result of their ability to appropriate part of their firm profits, that is, as income from capital (Krugman, 2007, ch. 7; Piketty, 2014, pp. 334–335 provide literature reviews on top managerial incomes supporting this view). At the same time, focusing on the average instead of the median compensation brings our contribution into a closer relationship with the research on the determinants of decreasing labour shares (cf. Schwellnus et al., 2018).[8]

In reviewing the empirical literature in this section, we refer only to works that comparably focus on the decoupling of the average compensation growth from productivity growth (but we also refer to the research on the determinant of the drop in the labour share in the next sections). Among these, Stansbury and Summers (2017) estimate a coefficient of about 0.7 for the nexus between the growth rate of the real average compensation and that of productivity in the United States during the period 1974–2016; while the decoupling has been more intense in recent years (1999–2016), with an average coefficient of about 0.5. The relationship is also estimated for other major countries by Stansbury and Summers, with mixed findings. On the one side, the UK, Canada and West Germany (pre-reunification) reflect a strong degree of linkage (with coefficients of 1.55, 0.95 and 0.88, respectively); on the other side, Japan (0.20), post-reunification Germany (0.23), France (0.32) and Italy (0.42) present smaller coefficients (i.e. larger decoupling).[9] Greenspon et al. (2021) update the above analysis for the United States and Canada to include 2019. The results for the United States are similar to those of Stansbury and Summers (2017), while the coefficient on productivity for Canada is approximately 0.5 in the 1961–2019 period, and close to 0 between 1997 and 2019. Decoupling of average compensation and productivity in Canada, with an overall gap of 16 percentage points at the end of the 1976–2019 period, is also found by Sharpe and Ashwell (2021). For the UK, Teichgraber and Van Reenen (2021) find that productivity and average compensation grew in step between 1981 and 2019, whereas a significant decoupling occurred with regard to the median wage. Dixon and Lim's (2020) estimates of decoupling in the US nonfinancial corporation sector from the early 2000s to recent years are in line with the above findings for the entire economy. Evidence of decoupling is also provided by Škare and Škare (2017) for 10 selected OECD countries for the period 1950–2014. The study finds some country heterogeneity and identifies the 1980s as the dominant turning point for the start of the decoupling process. Pasimeni (2018) studies the decoupling of productivity from average compensation in Europe, finding that productivity gains have translated into increasing income for workers at about 50

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per cent, with a stronger link in the period 1970–1998 than after the onset of the monetary union. Criscuolo and Schwellnus (2018) present evidence on country-specific decoupling for 24 OECD countries (it should be noted that they refer to the average wage instead of the average compensation). While finding cross-country heterogeneity, for the period 1995–2013 they estimate an average yearly growth rate of productivity of 1.3 per cent, compared to a 1 per cent average growth in earnings. For an unbalanced panel of 28 European Union member states, Prenner (2018) finds that a 1 per cent increase in productivity is associated with a 0.65 per cent increase in the real average compensation over the 1960–2018 period. Theodoropoulou (2019) presents country-specific evidence regarding the link between labour productivity and the average compensation in 25 EU member states (1970–2017) by using 3-year moving averages and controlling for the trend in unemployment. The results are quite mixed, but significant decoupling is found in Portugal (with a coefficient equal to 0.46), Italy (0.50), the United Kingdom (0.54) and Spain (0.61). In almost all cases, Theodoropoulou's results testify to a depressing effect of unemployment on the growth rate of compensation.[10]

As can be seen from this review, the existing literature concentrates on country-specific studies of decoupling. Although we recognize the relevance of studies concerning individual countries and their specific features, we believe it is also important to investigate the existence of common factors and trends across countries. Our work is therefore intended to fill this gap.

3 | EXPLANATIONS OF THE DECOUPLING

Despite a large amount of research on the determinants of decoupling, no clear consensus on the mechanisms behind it has emerged in the literature. The interpretations of the phenomenon are embedded in diverse analytical frameworks. With a certain degree of simplification, they can be categorized into 'technology-driven relative factor scarcity' ('technology-based' for brevity) and 'political economy' explanations. In what follows, we discuss their key features.

The technology-based argument is the main explanation of the pay-productivity decoupling (or equivalently the decrease in the labour share) in the neoclassical framework. Analyses adopting this perspective are bound to explain why processes involving an increase in the capital–labour ratio and/or technical progress did not lead to increases in real wages in line with productivity growth. This would normally be expected within this analytical approach, which posits relative stability of income shares over time (that is, an approximately one-to-one connection between the growth rate of the average compensation and that of productivity).[11] The most widespread explanation of the decoupling refers to the particular form that technical change has taken in the recent decades with the advent of computers and ICT. In this vein, various contributions tend to emphasize unskilled labour-saving technical progress (Hogrefe and Kappler, 2013; Bassanini and Manfredi, 2014; Grossman et al., 2017; IMF, 2017), which would cause a deterioration in pay for this type of labour, not compensated for, in the aggregate, by rising pay for the skilled group.[12] Besides that, Karabarbounis and Neiman (2014) argue that the labour share has decreased in the United States—and around the world—as a result of a fall in the price of investment goods. Combined with an elasticity of substitution between labour and capital greater than one, this would cause capital deepening and a reduction in the labour share.[13]

These interpretations, however, have been criticized for being at variance with observed phenomena and their timing (Elsby et al., 2013; Mishel and Bivens, 2021b), and measures of ICT diffusion have proven to be unconnected with changes in income distribution (Stockhammer, 2009). Stansbury and Summers (2017) have criticized this view on the grounds that there is no

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evidence that periods of fast productivity growth (a good proxy for technical change) are associated with an increase in the pay-productivity gap. Also pointing in this direction is the recent contribution by Guschanski and Onaran (2022), according to whom the effect of technological change on the labour share is not robust at the empirical level. In the empirical part of this article, we present some further evidence that does not confirm a negative association between the labour share and alternative indicators of technical change or ICT (see Section 5).

Another common type of explanation within this analytical framework are ones based on traditional models of international trade that emphasize relative factor scarcity as the driver of changes in distribution. Hence, in advanced economies, unskilled labour would suffer the most from the integration of emerging economies into international trade, while capital and skilled labour would benefit. The reverse is expected to happen in emerging, labour-abundant economies. These views too have been criticized on empirical grounds by arguments that the predictions of traditional international trade models are not consistent with the evidence of a deteriorating labour income share and wider skilled–unskilled pay differentials in emerging economies as well, as acknowledged by the IMF (2007a).

A relatively recent development within this framework concerns the role of 'superstar firms', which exhibit very low labour shares owing to high mark-ups made possible by monopolies in technical knowledge and/or specific technological features. The increasing weight—reflecting higher market concentration—of these innovative firms is therefore argued to be a major factor in the labour share decline at the aggregate level (Autor et al., 2017; Calligaris et al., 2018; Schwellnus et al., 2018). However, Döttling et al. (2017) found that concentration has increased in the United States yet decreased in Europe in industries that are very similar in terms of technology. Decreasing concentration in Europe has been also documented by Guschanski and Onaran (2018). In contrast with the interpretation discussed above, they estimate that market concentration did not play an important role in the decline in the labour share.

Interestingly, many recent contributions that adopt an imperfect competition framework have emphasized institutional changes negatively affecting workers' bargaining power as the major determinant of the decoupling. A recent work by Stansbury and Summers (2020), for example, highlights the decline in workers' bargaining power caused by institutional changes that hamper workers' ability to obtain a share of the 'rents' generated (in some firms and industries) by imperfect competition.[14] The main changes behind this outcome, according to Stansbury and Summers, are fading unionization and increased shareholder orientation in firms' governance. The analytical framework underlying imperfect competition models, however, has some problematic implications, one of which is that such a decline in pro-worker institutions is said to bring about a decline in the 'equilibrium' (or average) unemployment rate, and yet this does not appear to fit the evidence for many European countries. In addition, as the decline of the real wage-productivity ratio should bring about higher 'labour intensity' (i.e. higher labour-to-capital and labour-to-output ratios), the observed change in the labour share ought to be relatively small, which is in contrast with the evidence.

By contrast, approaches grounded on political economy (henceforth, PE) imply that there is no necessary causal relation going from income distribution to the level of employment and unemployment. While income distribution is regarded as normally (i.e. even under competitive conditions) the result of the bargaining strength of the parties and social norms, employment levels essentially depend on effective demand. Accordingly, a change in the bargaining strength of workers is likely to affect real wages, and, as there are no assumptions of the traditional type concerning factor substitution, the effects on wage dynamics and income shares may be *significant*.

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The impact of technical innovation and globalization are conceptualized differently from a PE perspective, that is, as possible sources of changes in industrial relations and workers' bargaining power. Even from this different perspective, however, technical change is generally not found to be a major driver of the decline in wages relative to productivity. With regard to the United States, Elsby et al. (2013) underline the effect of offshoring labour-intensive production tasks; Mishel and Bivens (2021a) find that the major wage-suppressing factors have been high unemployment, eroded collective bargaining and corporate-driven globalization. Other contributions also emphasize the reduction in workers' bargaining power as a result of changing labour market institutions, social norms and policy orientation both in the United States and other mature economies (Pollin, 1998; Glyn, 2007; Levy and Temin, 2007; Bental and Demougin, 2010; Kristal, 2010; Bivens and Mishel, 2015; Sharpe and Ashwell, 2021). Among these interpretations, we can also include several contributions belonging to the broadly defined post-Keynesian tradition (among others, Onaran, 2011; Dünhaupt, 2017; Stockhammer, 2017; Pariboni and Tridico, 2019), which emphasize the role of labour market institutions, globalization and financialization in the erosion of the labour share.[15] Concerning the effect of unemployment in reducing the bargaining power of workers, Stirati and Paternesi Meloni (2021) highlight the impact of labour market slack in depressing the labour share in the private sector of the economy for major OECD countries. Finally, Guschanski and Onaran (2022) find that in OECD countries offshoring and changes in labour market institutions are relevant factors in reducing the labour share, whereas evidence of the effect of technological change is not robust.

In the next section, we explain in greater detail how macroeconomic and institutional dimensions that will be used in our empirical analysis may have impacted on labour incomes in mature countries.

4 | FACTORS AFFECTING INCOME DISTRIBUTION: POLITICAL ECONOMY DIMENSIONS

In parallel to the technology-based argument, another line of inquiry sees the social, economic and institutional environment as capable of persistently altering the distribution of income between labour and capital. The PE approach posits that the functional distribution of income (that is, the distribution between labour incomes and profits/rents) can be seen as 'the most immediate indicator of the balance of forces between labour and capital' (Franzini and Pianta, 2015, p. 71).

Within this perspective too, however, some questions and controversies arise. The primary set of inquiries concerns the main channels through which the distribution of income may be affected: should a major role be attributed to changes in labour market conditions and institutions (Pollin, 1998; Glyn, 2007; Levy and Temin, 2007; Mishel and Bivens, 2021a); should this work mainly through an increase in the interest rate, that is, the pure remuneration of capital affected in turn by changes in monetary policy or financial markets (Pivetti, 1991; and, on partly different grounds, Hein and Schoder, 2011; Hein, 2014); or should the main culprit be sought in the change in firms' governance and the balance of power among different stakeholders (Lazonick and O'Sullivan, 2000)? Furthermore, what has been the weight of globalization and financialization in affecting income distribution, taken alone, or acting through the channels mentioned above? The overall debate on these issues is far from reaching a unanimous conclusion, and the findings depend to a certain extent on the choice of variables and indicators used to represent the various dimensions. Our exploration contributes to this line of inquiry by making use of alternative indicators belonging to four extensive (and not necessarily mutually exclusive) dimensions, which we discuss in

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the remainder of this section. In this way, and by adopting some methodological refinements, our work may clarify and improve our understanding of the role and weight of various institutional and macroeconomic dimensions in affecting income distribution.

4.1 | Labour market slack

The PE approach suggests that persistent unemployment, and more generally a greater slack in the labour market, may have worked as a wage-moderating factor. Analysis of this dimension has gained momentum only recently, as capitalist economies, and particularly European countries, have featured higher and persistent levels of unemployment. However, in the analyses of the classical economists and Marx, which can be regarded as the historical and analytical roots of the conflict theory of income distribution, labour market conditions are regarded as relevant factors that can affect wages, along with, of course, other institutional, historical and political elements. This view finds empirical support in recent works documenting a negative effect of labour market slack on the labour share (Kristal, 2010; Dünhaupt, 2017; Pariboni and Tridico, 2019; Stirati and Paternesi Meloni, 2021). The downward pressure exerted on wages by unemployment is also found in the OECD's (2014a) study.

It is important to note a potential *caveat* concerning the literature to date, as labour market conditions and their impact on wage dynamics are usually described using the unemployment rate. There are reasons, however, to regard unemployment as a useful but incomplete indicator of labour market conditions. For instance, the variability of the unemployment rate may be limited because a persistent lack of employment opportunities may induce adjustments on the supply side while a sustained labour demand can stimulate participation and reduce underemployment.[16] Indeed, the ECB (2017) documented a marked decline in unemployment rates across many euro area economies after 2010, combined with subdued wage growth. This may suggest a higher degree of labour market slack than is measured by the unemployment rate, and takes the form of inactivity and underemployment (Bell and Blanchflower, 2018). Another debated point is the impact of the duration of unemployment. According to Shaikh (2016), unemployment has a more intense depressing effect on real wages when its duration increases; whereas other contributions posit that long-term unemployment exerts nil or very limited downward pressure on money wages (e.g. Layard et al., 1991; Rusticelli, 2015).

On this basis, we include in our analysis not only the unemployment rate but also some enlarged metrics that take into account: (i) the diffusion of involuntary part-time jobs as a measure of underemployment; (ii) the duration of unemployment; and (iii) multidimensional indicators—including the participation rate, employment rate and employment growth—to represent the situation of the labour market.

4.2 | Globalization

Increasing trade openness, or more generally the intensified process of globalization, is often viewed as a driver of wage stagnation in high-income economies by contributions that endorse the PE approach. However, the possible role of globalization and global value chain expansion in altering income distribution and fostering wage inequality is also considered by mainstream contributions (Autor et al., 2015, 2016; Berlingieri et al., 2017; Schwellnus et al., 2018) and institutional research (European Commission, 2007). From the latter perspective, globalization is supposed to

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benefit capital in advanced economies and unskilled labour in developing countries, consistent with the Stolper and Samuelson (1941) theorem that is grounded on the role of relative factor scarcity. In this regard, globalization is also seen as a possible cause of wage moderation reflecting the major increase in the worldwide (unskilled) labour supply that has resulted from the expansion of international trade and the large newcomers—such as the BRICS countries—that have been integrating into global markets (Acemoglu, 1998, 2003).

By contrast, the PE approach argues that international trade and capital mobility have an impact on income distribution primarily by affecting the bargaining position of the parties (Rodrik, 1998). Accordingly, globalization may contribute to weakening labour compared to capital in both mature and emerging countries (Stockhammer, 2017), and this mainly happens due to asymmetries in factor mobility. Redistribution from labour to capital may be caused by offshoring practices (Onaran, 2011; Stockhammer, 2017; Guschanski and Onaran, 2018) but also by a 'threat effect' as wage moderation can occur even without actual changes in production locations (Burke and Epstein, 2001; Tridico and Paternesi Meloni, 2018). In addition, the entry into global markets of economies with large labour reserves and low wages may have increased the competition in product markets, thus also favouring wage stagnation (ILO, 2008). The contributions that document the effects of globalization on wages or income inequality typically make use of imports and exports to describe trade openness (Rodrik, 1997; Stockhammer, 2013), and of foreign direct investment to capture the aspects of globalization related to capital mobility (IMF, 2007b; Onaran, 2009). Guschanski and Onaran (2018, p. 49) clarify that 'several empirical studies find substantial negative effects of variables measuring trade intensity (imports plus exports as a ratio to the GDP), foreign direct investment or offshoring, in line with the hypothesis that trade liberalization increases the fall-back options of capital'. Among these works, IMF (2007a), Stockhammer (2013) and OECD (2015) find negative, albeit small, effect of globalization on the share of income going to wages in high-income countries. In addition to the usual indicator based on the sum of export and import shares, our study also controls for imports and exports separately. This may be useful because, although there could be some reverse causation between wages and external trade, an increase in the import propensity may more accurately reflect competitive pressures from import penetration in mature economies (Boulhol et al., 2011).

Another quite distinct aspect of external trade that may affect real wages is the change in the real exchange rate. Real depreciation involves an increase in the price of imported inputs and consumer goods and, hence, if the nominal wage does not keep pace, a loss of workers' purchasing power (and vice versa; Stirati and Paternesi Meloni, 2018). On the other hand, the real exchange rate may have indirect opposite effects on labour incomes if it stimulates (or depresses) net exports and hence employment growth and/or unemployment (included in our set of dimensions).

4.3 | Financialization

Financial motives, actors and instruments are currently widely recognized as features of growing importance in advanced economies (Epstein, 2005). Such growing importance, broadly identified as financialization—or finance-dominated capitalism (Hein, 2015)—is often considered to be among the drivers of the decreasing labour share in advanced economies.[17] Without overlooking the fact that increasing financialization may assume heterogeneous shapes across advanced countries (Karwowski et al., 2020), the PE approach generally converges on the idea that financialization is an intrinsically 'redistributive process' (Van der Zwan, 2014, p. 108).[18] Stockhammer (2013) develops this argument in more depth and identifies two possible channels through which

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financialization may have relevant effects on the bargaining position of labour and hence may act as a wage moderation factor. First, businesses have gained more options for investing; specifically, they can invest locally or abroad, but they can also choose to invest in real or financial assets. Second, financialization has empowered shareholders relative to workers. According to the literature on financialization and corporate governance, one of the reasons why the latter could adversely affect wage patterns is the reduced incentive to enhance long-term growth through real investment (Van Treeck, 2009; Tori and Onaran, 2017), with firms being more oriented toward short-term strategies and 'downsize and distribute' behaviour (Lazonick and O'Sullivan, 2000; OECD, 2012; Lazonick, 2014; Van Treeck, 2015; Blecker, 2016; Palley, 2016).

Nevertheless, the effects of increasing financialization on labour incomes are not so clear at the empirical level. In part, this is because financialization is a phenomenon that can be observed from various perspectives (Hein, 2015; Dünhaupt, 2017; Pariboni and Tridico, 2019; Pariboni et al., 2020), including its connections with the process of globalization (Stockhammer, 2017; Tridico and Paternesi Meloni, 2018) and the influence of financial assets returns on the profit rate. This makes it difficult to translate financialization into a single and independent metric. Previous contributions make use of market capitalization (Pariboni and Tridico, 2019) and credit from banks and other financial operators (Gouzoulis, 2021), finding a negative but moderate effect on the labour share. In addition, foreign direct investment and foreign assets/liabilities are also used as a proxy for financial globalization (Stockhammer, 2017). Other proxies, such as the ratio of distributed dividends over GDP as an indicator of the change in firms' governance (Duménil and Lévy, 2001; Hein and Schoder, 2011; Onaran et al., 2011), may produce results that are difficult to interpret clearly. This is the case since an increase in that ratio may reflect *both* an increased share of dividends being paid out of profits and an increased share of profits in GDP (which is an accounting counterpart of a decline in the labour share). To deal with this issue, we use the dividends-to-profit share ratio as a more appropriate proxy. At any rate, some of the mentioned above contributions find a significant negative effect of financial variables on wage dynamics and the labour share (Stockhammer, 2017; Pariboni and Tridico, 2019). In our empirical analysis, we consider all the variables listed above.

4.4 | Labour market institutions

Institutions, laws and social norms operating in favour of workers are generally considered to support wages inasmuch as they tend to increase workers' bargaining power. Public policies and practices are also recognized in the process of 'promoting a broader sharing of productivity gains, both by supporting wages at the bottom of the wage distribution and raising labour shares' (OECD, 2018, p. 60). Among these factors, the literature includes trade union density (Kristal, 2010; Stockhammer, 2013; Bengtsson, 2014; Prenner, 2018; Tridico and Paternesi Meloni, 2018), collective bargaining coverage (Dell'Aringa and Pagani, 2007; Iversen et al., 2016), generosity of unemployment benefits (Guichard and Rusticelli, 2010), employment protection legislation (Tridico, 2013) and the diffusion of part-time and temporary contracts (Pariboni and Tridico, 2020).[19]

Despite some difficulties in measuring the vigour of institutions and policies, the general process of labour market flexibilization, declining union power and erosion of pro-workers institutions is well documented in the literature (Deakin et al., 2014; Brancaccio et al., 2018; Tridico and Paternesi Meloni, 2018; Hein et al., 2021). At the same time, a positive association between wage growth (or higher labour share) and protective institutions is generally acknowledged, although some degree of controversy emerges in empirical studies. In this regard, a study by the

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European Commission is quite representative. In the narrative and descriptive section, it is maintained that 'increases (decreases) in trade union density are accompanied by increases (decreases) in the labour income change' (European Commission, 2007, p. 250); while in the same study, econometric analyses taking into account several explanatory variables conclude that union power has, on aggregate, a null effect on income distribution (a positive effect is found for medium-to-high-skilled workers and a negative effect is even identified for low-skilled workers). This study also suggests, in its descriptive section, that changes in the labour income share are not related to the presence of minimum wage legislation, even though, on econometric grounds, such legislation is found to exert upward pressure on the labour share. Similarly, the IMF (2007a) does not find a significant contribution by labour market policies and institutions to the labour share of income, contrary to what would be expected in the PE approach, which attributes an important role to the bargaining power of workers. It is notable that Stockhammer (2013, 2017) reports that the only proxy for labour market institutions that presents a significant (positive) influence on the labour share is trade union density, while no significant effects are apparent for employment protection legislation, minimum wages and unemployment benefits. In Dünhaupt (2017), unions are even found to have a negative impact on the labour share.

On the other hand, a large body of literature provides evidence of the positive effects of pro-worker institutions on the growth of wages or the labour share. Pariboni and Tridico (2019) conclude that the index of employment protection is positively associated with the labour share in mature economies. Similarly, Ciminelli et al. (2022) find significant negative effects of job protection deregulation on the labour share, contributing about one tenth of its decline in a sample of 26 advanced economies after 1970. Analogously, Damiani et al. (2020) find that legislative innovations that favour the extensive use of temporary contracts have negatively affected the labour share in European countries. A positive correlation between employment protection and the labour share is also documented in Deakin et al. (2014) and Brancaccio et al. (2018).[20]

Alternative forms and strengths of institutions operating in the labour market may be central to explaining cross-country differences in their influence on wage growth and income inequality (Lemieux, 2011; Pontusson, 2013). In this regard, Pariboni and Tridico (2019) indicate that, particularly in Europe, the policy agenda is moving toward so-called 'flexicurity', a paradigm that promotes some types of income safety-nets while taking into account the need for flexibility on the part of firms (Denmark is the archetypal example). Also relevant in this context is the argument by Baccaro and Howell (2011) that in several countries the neoliberal turn took place less through an institutional change in the strict sense than through a change in the role of existing institutions. For example, national wage contracts established by trade unions and employers' associations may still exist but now be subject to many derogation clauses that tend to depress their impact dramatically. Alternatively, trade unions may have accepted a line of strong wage moderation and hence even generated a negative impact, as found by Dünhaupt (2017). Iversen et al. (2016) argue that union membership is in structural decline in nearly all advanced economies (as also documented by Meyer, 2019), but the coverage of union wage agreements has not shrunk in line with the membership, suggesting that union density should be considered a better candidate for capturing the erosion of the labour movement's power.[21] This leads to the conclusion that a number of common indicators in empirical analyses that are based on the existence of certain institutions, policies and practices should be used with caution as they may not be particularly appropriate for registering the changes that are actually taking place or for representing the same facts and trends across countries. To deal with this, our empirical analysis makes use of a wide range of indicators of the vigour of institutions.

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5 | ECONOMETRIC EXPLORATION

We now turn to the empirical part of the article. Our investigation assesses the association between the growth rate of the average compensation in real terms (our dependent variable) on the one side, and labour productivity growth and a set of dimensions relevant to our discussion on the other side. This approach allows us to elaborate on two distinct elements. First, by analysing the coefficient associated with labour productivity growth, we are able to quantify the extent to which productivity gains have translated into compensation growth across the period studied, and in turn capture the magnitude of the decoupling. Second, as we are interested in explaining why income distribution has been changing, we consider the effect of other dimensions on the growth rate of the average compensation. Accordingly, next to productivity growth, we include variables that are aimed at assessing the significance and weight of the factors that we discussed in the previous section. Table 1 reports the abbreviations used in the remaining sections of the article to identify our variables.

As our exploration is confined to advanced economies, we need a criterion for defining and selecting them. We follow Girardi et al. (2020) and define 'mature' countries as the ones that joined the OECD before 1973. We thus identify 22 advanced capitalist economies.[22] The time span is from 1970 to 2018, and it is dictated by data availability.

As a first step, we put under scrutiny the technology-based explanation discussed in Section 3. To do so, we are forced to make a deviation from our main modelling strategy in which the dependent variable is the growth rate of the (real) average compensation and productivity growth is an explanatory variable. The reason for this is that we cannot use a measure of technological innovation next to productivity growth due to evident problems of endogeneity. To avoid this problem, we assess the technology-based argument by verifying if a negative association holds in our panel of countries between the labour share and alternative indicators of technical change. For this purpose, we estimate the regression-based correlation depicted in Equation (1):

$$\Delta LS_{i,t} = \alpha_i + \delta_t + \beta_T TC_{i,t} + \varepsilon_{i,t} \quad (1)$$

where ΔLS is the yearly change of the adjusted (for self-employment) labour share in country i at year t; TC represents a proxy for technology or technical change; α_i and δ_t are country and year fixed effects, respectively; and $\varepsilon_{i,t}$ denotes the error term. If technology plays a role in altering the functional distribution of income, we expect a negative value of β_T. As is standard in the literature (cf. European Commission, 2007; IMF, 2007a; Stockhammer, 2017), we make use of indicators of ICT as proxies for technology or technical change. The results are reported in Table 2 and offer a mixed picture. When using unaveraged data, none of the selected proxies for TC present a statistically significant association with the annual variation of the labour share. When averaging over the cycle employing 5-year moving averages, a negative and statistically significant association is found only for the index of ICT capital stock (ICT_CS). By contrast, a positive and statistically significant coefficient holds for the share in GDP of ICT-based sectors (ICT_GDP). The coefficient associated with variables capturing the contribution to growth stemming from ICT capital is virtually null, in the case of both capital stock (ICT_CC_C) and national income (ICT_CC_GDP).[23] This evidence, combined with earlier research (see the literature discussed in Section 3, particularly Stockhammer, 2009; Guschanski and Onaran, 2022), casts doubt on the soundness of the technological argument for explaining the process of redistribution away from labour, and further validates a PE viewpoint.

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TABLE 1 List of abbreviations

LS	Labour share in the total economy	*EG*	Employment growth with opposite sign
TC	Technical/technological change	*GLOB*	Globalization
ICT_GDP	Share on GDP of ICT-based sectors	*EXP*	Export of goods and services (% of GDP)
ICT_CS	ICT capital stock index	*IMP*	Import of goods and services (% of GDP)
ICT_CC_C	ICT capital contribution to capital growth	*OPEN*	Trade openness (EXP+IMP)
ICT_CC_GDP	ICT capital contribution to GDP growth	*FIN*	Financialization (alternative proxies)
COMP	Average labour compensation	*CRED*	Credit provision (% of GDP)
WAGE	Average gross wage	*MKT*	Market capitalization (% GDP)
PROD	Labour productivity	*DIV*	Dividends as share of profits (total economy)
RIR	Real interest rate	*DIV_NFC*	Dividends as share of profits (non-financial corporations)
REER	Real effective exchange rate	*FGL*	External assets plus external liabilities (% of GDP)
LMS	Labour market slack	*FDI*	Foreign direct investment, inward plus outward (% of GDP)
UN	Unemployment rate	*LMI*	Labour market institutions
UN_N	Unemployment rate (standardized)	*TU*	Trade union density
INV_PT	Incidence of involuntary part-time workers	*EPL*	Employment protection legislation (regular contracts)
STU	Short-term unemployment rate	*EPL_T*	Employment protection legislation (regular temporary)
LTU	Long-term unemployment rate	*BC*	Collective bargaining coverage
UN_INT	Unemployment intensity	*RR*	Replacement rate
UND1	Broad measure of underemployment (v.1)	*PT*	Share of part-time contracts
UND2	Broad measure of underemployment (v.2)	*TEMP*	Share of temporary employment
PR	Missing participation rate (1 minus participation rate)	*D*	Dummy (1 in case of strong bargaining power of workers)
ER	Missing employment rate (1 minus employment rate)	*GAP*	Growth rate *COMP* of minus growth rate of *PROD*

Note: Details on the definition, calculation and source of each indicator are reported in Appendix 1 in the Supporting Information.

We now introduce our main modelling strategy where, for methodological reasons (see Section 1), we treat the growth rate of productivity and that of the average labour compensation separately. Our dependent variable (ΔR_COMP) is the yearly rate of change of the average labour compensation (that is, including social contributions) per employee, expressed in real terms. We alternatively deflate compensation by employing the CPI index, as it is more representative of the trends of prices in the basket consumed by workers, and the GDP deflator, so as to use the

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TABLE 2 Income distribution and different proxies for technology and/or technical change

Dependent variable	Model with ICT_GDP		Model with ICT_CS		Model with ICT_CC_C		Model with ICT_CC_GDP	
Δ*LS*	**Unaveraged**	**5-year MA**	**Unaveraged**	**5-years MA**	**Unaveraged**	**5-years MA**	**Unaveraged**	**5-years MA**
TC	−0.047	0.785***	−0.009	−0.051***	0.037	0.003	0.116	0.397
	(0.093)	(0.000)	(0.009)	(0.018)	(0.074)	(0.116)	(0.311)	(0.498)
Observations (Countries)	653 (22)	673 (22)	638 (21)	664 (21)	639 (21)	664 (21)	633 (21)	657 (21)

Note: Δ*LS* is the yearly change of the adjusted labour share in the total economy. Time span: 1970–2018. All estimations include country and time fixed effects (constant term not reported, accordingly). Robust standard errors in parentheses.Abbreviations: MA, moving averages; *TC*, technology and/or technical change (alternative proxies).*, ** and *** denote 1%, 5% and 10% levels of significance.

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same deflator of labour productivity.[24] The first regressor we consider is the annual rate of growth of labour productivity (ΔR_PROD), measured as the rate of change of the real GDP per person employed.[25] We then draw from the literature to identify variables that represent the macroeconomic and institutional dimensions discussed in Section 4.[26] In addition to productivity growth, each model may alternatively or jointly include the following regressors:

- An index of labour market slack (LMS), the coefficient of which we expect to be negative. In addition to the unemployment rate (UN), we pay attention to: (i) the incidence of involuntary part-time contracts as a measure of underemployment (INV_PT); and (ii) the duration of unemployment by considering the short-term (STU) and the long-term (LTU) unemployment rate, as well as an index of unemployment intensity ($UNINT$) constructed in the spirit of Shaikh (2016).[27] Moreover, we assess the potential effect of enlarged measures of slack in the labour market, that is, the missing employment rate (ER), the inverse of the employment growth (EG) and the missing participation rate (PR). Finally, we make use of two original, multidimensional indicators of slack that condense three measures of underemployment: $UND1$ combines UN, ER and PR; while $UND2$ combines UN, EG and PR. The multidimensional indicators are constructed utilizing a principal component analysis, as detailed in Appendix 2 in the Supporting Information.[28]
- A metric of globalization ($GLOB$) in terms of trade openness. This dimension is alternatively represented by the share in the GDP of exports of goods and services (EXP), imports of goods and services (IMP) and trade openness ($OPEN$), the last expressed as the sum of the import and export shares.
- An index of financialization (FIN). We refer to pure financial variables related to the domestic economy, such as credit provision ($CRED$) and market capitalization (MKT), and to variables that may provide indications concerning the effects of financialization understood as international finance and capital mobility, such as an index of financial globalization (FGL), which is the sum of foreign assets and liabilities (as a share of GDP), and foreign direct investment (FDI), expressed as inflows plus outflows (as a share of GDP). We also make use of a variable representing the 'downsize and distribute' behaviour of businesses. Specifically, to avoid a spurious representation of the phenomenon (see Subsection 4.3), we do not refer to distributed dividends as a share of GDP but as a share of profits, both in the total economy (DIV) and in non-financial corporations (DIV_NFC).
- A variable representing the vigour of labour market institutions (LMI), the coefficient of which we expect to be positive. Institutions are alternatively represented by trade union density (TU), an index of employment protection legislation for both regular contracts (EPL) and temporary contracts (EPL_T), collective bargaining coverage (BC) and the generosity of unemployment benefits, the last measured using the replacement rate (RR).[29] Within this class of variables, we also include the share of temporary contracts ($TEMP$) and the share of part-time contracts (PT), the coefficients of which we conversely expect to be negative.
- We also consider the real interest rate (RIR) and the dynamics of the real effective exchange rate ($\Delta REER$, an increase meaning real appreciation). This allows us to investigate further the possible effects on compensation growth of some general features of financialization and globalization. Specifically, the inclusion of RIR reflects the possibility that compensation would be affected by the interest rate levels, whereby a high interest rate would be associated with a higher rate of profit (and hence higher profit shares), while $\Delta REER$ represents the evolution of relative prices of imports, which generally impacts on production and living costs.

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The nature of our research question leads us to follow the approach of panel analysis. This strategy is commonly used in the literature on the determinants of the labour share (Stockhammer, 2017; Dünhaupt, 2017; Pariboni and Tridico, 2019) and in a small number of contributions in which the regressing variable is the growth rate of compensation instead of the labour share (Stirati and Paternesi Meloni, 2018; Kiss and Van Herck, 2019). The model can be expressed generally as shown in Equation (2):

$$\Delta R\_COMP_{i,t} = \alpha_i + \delta_t + \beta_D \Delta R\_PROD_{i,t} + \varepsilon_{i,t} \tag{2}$$

The interpretation of this extremely simplified model is straightforward: the size of the decoupling between productivity and pay is expressed by the coefficient β_D, which allows us to assess the extent to which productivity gains translate, on average, into real compensation growth. With this coefficient equal to 1, productivity growth completely translates into a higher compensation and no changes in the labour share would be detected; this case represents the 'strongest linkage'. By contrast, we witness the 'strongest delinkage' if the coefficient is virtually 0. According to the literature, we expect β_D to range between 0 and 1.

As we are interested in understanding how a variety of factors besides productivity growth have affected compensation growth, we include the variables described above, as shown in Equation (3):

$$\begin{aligned}\Delta R\_COMP_{i,t} = \alpha_i + \delta_t + \beta_D \Delta R\_PROD_{i,t} + \beta_R RIR_{i,t} + \beta_C \Delta REER_{i,t} + \beta_U LMS_{i,t} + \beta_F FIN_{i,t} \\ + \beta_G GLOB_{i,t} + \beta_L LMI_{i,t} + \varepsilon_{i,t}\end{aligned} \tag{3}$$

It should be noted that in all our specifications we make use of both country (α_i) and time (δ_t) fixed effects, which enable us to control explicitly for spatial heterogeneity, specific time effects and/or coordinated business cycles (Girardi et al., 2020). Furthermore, time fixed effects reduce the risk of errors due to omitted variables. All the variables have been checked to be panel stationary by means of a Fisher-type unit-root test based on augmented Dickey–Fuller tests (Choi, 2001).[30] As our principal tool, we use the feasible generalized least squares (FGLS) estimator. This estimator is particularly appealing for use in our framework as it allows robust estimations in the presence of autocorrelation within panels as well as cross-sectional correlation and heteroscedasticity across panels. We also test the robustness of our reference model to alternative estimators, namely: (i) an autoregressive AR-FGLS estimator with AR(1) disturbance; (ii) an Arellano–Bond estimator for dynamic panel data; (iii) a linear GMM (generalized method of moments) estimator; and (iv) a system GMM estimator. On the one hand, the main advantage of AR-FGLS is that it explicitly considers the possible autoregressive component of compensation growth; on the other, linear GMM, system GMM and Arellano-Bond estimators are more likely to address potential endogeneity problems.

Importantly, we also consider 5-year fixed or moving averages to deal with the documented cyclicality of labour productivity (Okun, 1962; Basu, 1996) and wages (Stirati, 2016), and to capture the 'structural' effects of persistent changes in our variables, which we expect to display an impact on the bargaining power of the parties and on real compensation only over some length of time.

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6 | FINDINGS AND DISCUSSION

Our findings are presented in four sequential steps. First, we estimate a 'simple model' (henceforth, SM) through Equation (1) to quantify the size of the decoupling between productivity and pay. Accordingly, we consider exclusively the rate of growth of the average compensation (in real terms) and that of labour productivity (Table 3), controlling for a full set of country and year fixed effects. Second, we estimate a 'baseline model' (henceforth, BM) by adding some regressors to the SM, as in Equation (2). Specifically, we consider the effects on compensation growth stemming from the unemployment rate or enlarged measures of *LMS* (Table 4) along with the dynamics of the real exchange rate ($\Delta REER$) and the real interest rate (*RIR*). Third, we estimate an 'extended model' (henceforth, EM) by adding to the BM one further dimension at a time, namely *GLOB* (Table 5), *FIN* (Table 6) and *LMI* (Table 7). Fourth, we build a 'general model' (henceforth, GM) by taking stock of what emerged from the three estimated EMs. Here, we focus on variables with coefficients that are statistically significant and relevant in size and consider them simultaneously by estimating a far-reaching model (Table 8).

6.1 | Main findings

Decoupling between the growth rate of productivity and that of the real average compensation clearly emerges from the SM. The coefficient β_D is lower than one and decreases over time (see Table 3). It settles at about 0.4 when considering the whole period, and diminishes to 0.14 if the analysis is confined to the last two decades. When using 5-year averages (MA or FA) to avoid cyclical fluctuations and capture persistent structural relations, the decoupling is lower, as the coefficient β_D is approximately 0.55 for the whole period. The estimated decoupling is slightly lower (with a coefficient of 0.6) when compensation is deflated using the same deflator as labour productivity (i.e. the GDP deflator), reflecting the fact that consumer prices have grown at a faster rate than product prices in most OECD countries (cf. OECD, 2018). However, we do not find any association between productivity and pay so deflated in the period 1999–2018: the coefficient is close to 0 and not statistically significant. For this period therefore, we find a *delinking* between pay and productivity according to the definition proposed by Greenspon et al. (2021; see note 1 above). When using moving averages, the estimated size of the decoupling is quite in line with the prevailing empirical works reviewed in Section 2. The finding of larger decoupling in the last two decades is also consistent with the literature.

When we add some regressors (i.e. when estimating our BM), the picture becomes more comprehensive. While estimating a similar coefficient for the decoupling (β_D is approximately 0.35 in all the specifications presented in Table 4), we find a positive coefficient for $\Delta REER$ (about 0.10, indicating that real appreciation is associated with compensation growth) and a non-significant coefficient for the real interest rate. Furthermore, almost all the *LMS* indicators negatively affect compensation: the coefficient for the unemployment rate (*UN*) is negative and presents the expected sign, standing at about −0.2. If we consider that the unemployment rate settled at about 3 to 4 per cent during the 1970s (panel average), whereas they were approximately 7 per cent in the post-2000 period, the estimated coefficient indicates that labour market slack may have contributed, other things being equal, to cutting back the annual growth rate of compensation by about 0.55 percentage points. We also find a negative (and statistically significant) coefficient associated with the share of involuntary part-time employment, intended as a measure of

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TABLE 3 Simple model of decoupling

	CPI-deflated compensations					Product price-deflated compensations				
Dependent variable ΔR_COMP	**Model 1**	**Model 2 (5-year MA)**	**Model 3 (5-year FA)**	**Model 4 (1980–2018)**	**Model 5 (1999–2018)**	**Model 6**	**Model 7 (5-year MA)**	**Model 8 (5-year FA)**	**Model 9 (1980–2018)**	**Model 10 (1999–2018)**
ΔR_PROD	0.381***	0.586***	0.555***	0.288***	0.143***	0.338***	0.601***	0.594***	0.239***	0.075
	(0.046)	(0.039)	(0.093)	(0.048)	(0.056)	(0.043)	(0.040)	(0.091)	(0.048)	(0.060)
Observations (Countries)	904 (22)	904 (22)	190 (22)	731 (22)	396 (22)	904 (22)	904 (22)	190 (22)	731 (22)	396 (22)
Adjusted R^2	0.301	0.658	0.595	0.195	0.254	0.257	0.580	0.558	0.151	0.112
Wald statistic	$\chi2(67) = 370.31$	$\chi2(71) = 1732.70$	$\chi2(31) = 279.23$	$\chi2(58) = 177.34$	$\chi2(39) = 134.76$	$\chi2(67) = 301.07$	$\chi2(69) = 1249.07$	$\chi2(31) = 242.64$	$\chi2(58) = 131.95$	$\chi2(39) = 50.07$
Prob > χ^2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.110

Note: In Models 1 to 5, labour compensations are deflated by means of the CPI index; in Models 6 to 10, by means of the GDP deflator. Time span: 1970–2018 (unless specified differently). All estimations include country and year fixed effects (constant term not reported, accordingly). Robust standard errors clustered by countries in parentheses.Abbreviations: FA, fixed averages; MA, moving averages.***$p < 0.01$; **$p < 0.05$; *$p < 0.1$.

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TABLE 4 Baseline model (considering alternative indicators of labour market slack)

							Enlarged measures of *LMS*				
Dependent variable ΔR_COMP	**Model UN**	**Model UN (5-year MA)**	**Model INV_PT**	**Model LTU**	**Model STU**	**Model UNINT**	**Model UN_N**	**Model ER**	**Model EG**	**Model PR**	**Model UND1**	**Model UND2**
ΔR_PROD	0.359*** (0.042)	0.616*** (0.039)	0.230*** (0.046)	0.264*** (0.041)	0.273*** (0.041)	0.271*** (0.041)	0.363*** (0.043)	0.370*** (0.043)	0.411*** (0.045)	0.352*** (0.044)	0.352*** (0.046)	0.374*** (0.043)
ΔREER	0.098*** (0.014)	0.155*** (0.015)	0.126*** (0.018)	0.102*** (0.013)	0.097*** (0.013)	0.097*** (0.014)	0.098*** (0.014)	0.106*** (0.014)	0.100*** (0.014)	0.109*** (0.014)	0.105*** (0.015)	0.094*** (0.014)
RIR	0.018 (0.025)	−0.016 (0.016)	−0.118*** (0.030)	−0.113*** (0.029)	−0.105*** (0.028)	−0.119*** (0.027)	−0.011 (0.024)	−0.025 (0.024)	−0.003 (0.023)	−0.040* (0.023)	−0.026 (0.025)	−0.013 (0.024)
LMS	−0.212*** (0.033)	−0.153*** (0.018)	−0.137** (0.059)	−0.155*** (0.049)	−0.284*** (0.059)	−0.923*** (0.280)	−0.165*** (0.028)	−0.111*** (0.036)	−0.280*** (0.044)	−0.028 (0.026)	−0.105*** (0.039)	−0.268*** (0.035)
Observations (Countries)	825 (22)	891 (22)	511 (21)	673 (22)	673 (22)	684 (22)	825 (22)	831 (22)	831 (22)	822 (22)	816 (22)	816 (22)
Adjusted R^2	0.379	0.666	0.374	0.343	0.355	0.334	0.375	0.367	0.392	0.346	0.339	0.377
Wald statistic	$\chi2(69)$ = 504.37	$\chi2(72)$ = 1777.32	$\chi2(57)$ = 273.46	$\chi2(69)$ = 351.77	$\chi2(69)$ = 371.43	$\chi2(69)$ = 344.08	$\chi2(69)$ = 495.76	$\chi2(69)$ = 483.43	$\chi2(69)$ = 536.13	$\chi2(69)$ = 435.27	$\chi2(69)$ = 419.88	$\chi2(69)$ = 494.54
Prob > χ^2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Note: Labour compensation deflated by means of the CPI index. All coefficients on enlarged measures of LMS are comparable as variables are standardized. *INV_PT* not available for Australia. Time span: 1970–2018. All estimations include country and year fixed effects (constant term not reported, accordingly). Robust standard errors clustered by countries in parentheses.
***$p < 0.01$; **$p < 0.05$; *$p < 0.1$.

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TABLE 5 Extended model with globalization

Dependent variable ΔR_COMP	Model EXP	Model IMP	Model OPEN	Model EXP (5-year MA)	Model IMP (5-year MA)	Model OPEN (5-year MA)
ΔR_PROD	0.360*** (0.043)	0.359*** (0.044)	0.359*** (0.043)	0.614*** (0.039)	0.616*** (0.041)	0.614*** (0.039)
ΔREER	0.098*** (0.014)	0.097*** (0.015)	0.098*** (0.014)	0.157*** (0.015)	0.156*** (0.016)	0.156*** (0.015)
RIR	0.015*** (0.025)	0.022 (0.026)	0.019 (0.025)	−0.023* (0.016)	−0.023 (0.017)	−0.024 (0.016)
UN	−0.205*** (0.034)	−0.215*** (0.033)	−0.214*** (0.034)	−0.145*** (0.019)	−0.148*** (0.019)	−0.145*** (0.019)
GLOB	−0.684 (0.932)	1.605 (1.095)	0.151 (0.525)	−0.792*** (0.441)	−1.256** (0.559)	−0.525** (0.249)
Observations (Countries)	825 (22)	825 (22)	825 (22)	891 (22)	891 (22)	891 (22)
Adjusted R^2	0.379	0.381	0.380	0.667	0.668	0.667
Wald statistic	$\chi2(70)$ =505.24	$\chi2(70)$ =507.83	$\chi2(70)$ =504.50	$\chi2(73)$ =1786.97	$\chi2(73)$ =1793.77	$\chi2(73)$ =1790.55
Prob > χ^2	0.000	0.00	0.000	0.000	0.000	0.000

Note: Labour compensation deflated by means of the CPI index. Time span: 1970–2018. All estimations include country and year fixed effects (constant term not reported, accordingly). Robust standard errors clustered by countries in parentheses.***$p < 0.01$; **$p < 0.05$; *$p < 0.1$.

underemployment: the coefficient is about −0.14, although data are only available for a limited time span (post-1980s). Moreover, we estimate a negative and statistically significant effect regardless of the duration of unemployment, that is, for *LTU* (−0.15) and *STU* (−0.28). This is partly in contrast to New Keynesian models, as long-term unemployment causes downward pressure on wages, albeit with a smaller coefficient. In addition, the larger size of the coefficient for *UNINT* (−0.92), built on a comparable scale to *UN*, testifies that the depressing effect on wages becomes more intense when the average duration of unemployment increases. We also estimate the BM using enlarged metrics of *LMS* and find a negative and significant coefficient for the missing employment rate (the coefficient for *ER* is equal to −0.11, quite comparable with the one for *UN_N*), and a virtually null effect associated with the missing participation rate (*PR*); while we estimate a sizeable coefficient for *EG* (−0.23), testifying to a positive and stronger association between employment growth and compensation growth. Concerning our multidimensional indicators of *LMS*, both the coefficients are negative and significant. The coefficient for *UND*1 is in line with the one for the unemployment rate while *UND*2 exhibits the most depressing effect on real compensation growth. This depends on the impact of low or negative employment growth, which is the specific additional dimension included in this indicator.

Subsequently, we estimate three different EMs. First, we consider *GLOB* (Table 5). While corroborating the size of the decoupling, we find a negative and significant effect of all our variables (*EXP*, *IMP* and *OPEN*) on compensation growth when considering 5-year moving averages—interestingly, import penetration exhibits a higher coefficient than the others. No statistically significant effects are detected for unaveraged data. The fact that we find statistical significance in the coefficients of *OPEN* only when using MA makes economic sense: trade shares in domestic output may present high cyclicality, while they can affect wage bargaining only if their changes

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TABLE 6 Extended model with financialization

Dependent variable ΔR_COMP	Model CRED	Model MKT	Model FGL	Model FDI	Model DIV	Model DIV_NFC	Model CRED (5-year MA)	Model FDI (5-year MA)
ΔR_PROD	0.367*** (0.059)	0.289*** (0.038)	0.414*** (0.051)	0.303*** (0.043)	0.301*** (0.041)	0.281*** (0.045)	0.500*** (0.047)	0.539*** (0.039)
ΔREER	0.112*** (0.019)	0.054*** (0.013)	0.099*** (0.015)	0.100*** (0.013)	0.052*** (0.016)	0.075*** (0.016)	0.157*** (0.018)	0.147*** (0.014)
RIR	–	−0.051** (0.026)	0.031 (0.027)	−0.073*** (0.027)	−0.074*** (0.028)	−0.083*** (0.030)	–	−0.090*** (0.017)
UN	−0.155*** (0.049)	−0.163*** (0.028)	−0.226*** (0.042)	−0.183*** (0.032)	−0.183*** (0.030)	−0.177*** (0.033)	−0.139*** (0.022)	−0.136*** (0.018)
FIN	−1.743*** (0.390)	0.230 (0.266)	−0.890 (1.049)	−0.462 (0.397)	0.004 (0.022)	0.007 (0.056)	−1.547*** (0.194)	−0.893** (0.338)
Observations (Countries)	553 (22)	643 (21)	733 (22)	763 (22)	498 (19)	537 (20)	553 (22)	763 (22)
Adjusted R^2	0.395	0.388	0.376	0.350	0.472	0.437	0.676	0.668
Wald statistic	$\chi2(79) = 361.59$	$\chi2(65) = 407.25$	$\chi2(66) = 441.28$	$\chi2(70) = 470.78$	$\chi2(67) = 445.70$	$\chi2(68) = 417.85$	$\chi2(72) = 1253.39$	$\chi2(73) = 1676.34$
Prob > χ^2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Note: Labour compensation deflated by means of the CPI index. MKT not available for Iceland. Time span: 1970–2018. Model FGL refers to the period 1970–2011 due to data availability. All estimations include country and year fixed effects (constant term not reported, accordingly). Robust standard errors clustered by countries in parentheses.***$p < 0.01$; **$p < 0.05$; *$p < 0.1$.

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TABLE 7 Extended model with labour market institutions

Dependent variable ΔR_COMP	Model TU	Model EPL	Model EPL_T	Model BC	Model RR	Model TEMP	Model PT	Model TU (5-year MA)	Model EPL (5-year MA)	Model BC (5-year MA)
ΔR_PROD	0.322*** (0.041)	0.284*** (0.040)	0.303*** (0.052)	0.597*** (0.056)	0.326*** (0.040)	0.238*** (0.046)	0.237*** (0.048)	0.605*** (0.040)	0.462*** (0.039)	0.597*** (0.037)
ΔREER	0.090*** (0.013)	0.093*** (0.013)	0.088*** (0.014)	0.081*** (0.016)	0.078*** (0.013)	0.117*** (0.016)	0.116*** (0.017)	0.155*** (0.016)	0.151*** (0.014)	0.145*** (0.014)
RIR	0.023 (0.024)	−0.064** (0.025)	−0.092*** (0.030)	−0.011 (0.034)	−0.056** (0.026)	−0.083** (0.032)	−0.082** (0.034)	−0.033* (0.017)	−0.101*** (0.018)	−0.07*** (0.019)
UN	−0.234*** (0.032)	−0.155*** (0.031)	−0.180*** (0.035)	−0.217*** (0.038)	−0.197*** (0.030)	−0.159*** (0.036)	−0.158*** (0.039)	−0.161*** (0.019)	−0.112*** (0.019)	−0.148*** (0.018)
LMI	4.699*** (1.278)	0.513* (0.342)	0.238* (0.129)	2.672** (1.046)	3.284*** (0.931)	−1.883 (3.793)	−0.983 (4.246)	3.009*** (0.660)	0.251* (0.183)	0.823** (0.430)
Observations (Countries)	799 (22)	741 (22)	543 (22)	407 (22)	746 (21)	531 (22)	531 (22)	799 (22)	741 (22)	407 (22)
Adjusted R^2	0.406	0.404	0.404	0.547	0.443	0.367	0.366	0.677	0.684	0.705
Wald statistic	$\chi2(70) = 546.49$	$\chi2(70) = 503.60$	$\chi2(55) = 366.09$	$\chi2(70) = 491.35$	$\chi2(69) = 594.69$	$\chi2(51) = 307.91$	$\chi2(51) = 307.61$	$\chi2(73) = 1870.12$	$\chi2(73) = 1744.66$	$\chi2(73) = 2043.57$
Prob > χ^2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Note: Labour compensation deflated by means of the CPI index. *RR* not available for Australia. Time span: 1970–2018. All estimations include country and year fixed effects (constant term not reported, accordingly). Robust standard errors clustered by countries in parentheses.***$p < 0.01$; **$p < 0.05$; *$p < 0.1$.

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TABLE 8 General model

Dependent variable ΔR_COMP	Model I (EPL and OPEN, 5-year MA)	Model II (EPL and EXP, 5-year MA)	Model III (EPL and IMP, 5-year MA)	Model IV (TU and OPEN, 5-year MA)	Model V (TUand EXP, 5-year MA)	Model VI (TU and IMP, 5-year MA)	Model VII (EPL and FDI, 5-year MA)	Model VIII (TU and FDI, 5-year MA)
ΔR_PROD	0.497*** (0.039)	0.491*** (0.039)	0.498*** (0.041)	0.621*** (0.039)	0.619*** (0.039)	0.624*** (0.039)	0.464*** (0.041)	0.566*** (0.039)
ΔREER	0.149*** (0.014)	0.151*** (0.014)	0.147*** (0.015)	0.160*** (0.015)	0.161*** (0.015)	0.160*** (0.015)	0.148*** (0.014)	0.150*** (0.014)
RIR	−0.115*** (0.018)	−0.118*** (0.018)	−0.108*** (0.018)	−0.049*** (0.016)	−0.049** (0.015)	−0.048*** (0.016)	−0.104*** (0.018)	−0.095*** (0.016)
UND2	−0.143*** (0.020)	−0.134*** (0.020)	−0.156*** (0.021)	−0.181*** (0.021)	−0.179*** (0.021)	−0.183*** (0.021)	−0.146*** (0.021)	−0.181*** (0.021)
LMI	0.352** (0.169)	0.353** (0.170)	0.375** (0.177)	2.956*** (0.637)	2.978*** (0.638)	2.922*** (0.636)	0.561*** (0.172)	1.969*** (0.677)
GLOB	−1.529*** (0.293)	−2.407*** (0.508)	−3.292*** (0.658)	−0.512*** (0.255)	−0.849*** (0.452)	−1.099** (0.546)	–	–
FIN	–	–	–	–	–	–	−0.955*** (0.322)	−1.162*** (0.342)
Observations (Countries)	807 (22)	807 (22)	807 (22)	882 (22)	882 (22)	882 (22)	774 (22)	826 (22)
Adjusted R^2	0.693	0.696	0.698	0.671	0.672	0.671	0.677	0.664
Wald statistic	$\chi2(74) = 1863.17$	$\chi2(74) = 1848.13$	$\chi2(74) = 1864.55$	$\chi2(74) = 1764.73$	$\chi2(74) = 1802.78$	$\chi2(74) = 1804.39$	$\chi2(74) = 1624.25$	$\chi2(74) = 1635.72$
Prob > χ^2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Note: Labour compensation deflated by means of the CPI index. All estimations include country and year fixed effects (constant term not reported, accordingly). All variables are expressed as 5 years moving averages (5-year MA). Time span: 1970–2018. Robust standard errors clustered by countries in parentheses.***$p < 0.01$; **$p < 0.05$; *$p < 0.1$.

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are 'structural' and act over time. To give an idea of the overall impact of globalization, trade openness increased across our panel from 40 per cent in 1970 to 102 per cent at the end of the sample period. Given the estimated coefficient for *OPEN* (−0.52 using MAs), trade globalization may have decreased, *ceteris paribus*, the annual growth rate of compensation by about 0.3 percentage points.

Second, we include *FIN* (Table 6). Here, too, the magnitude of the decoupling is confirmed, while the only variables exhibiting a negative association with the growth rate of compensation are *CRED* and *FDI*, with the latter being statistically significant in the 5-year moving average specification.[31] We do not find statistically significant effects for *MKT* and *FGL*, even when averaging over the cycle. While the negative effect of capital mobility on wages is quite standard in the literature, the effect of credit provision has to be taken with caution as reverse causation may apply: households might resort to bank loans to a greater extent when labour incomes are low and stagnating (see Barba and Pivetti, 2009). Concerning distributed dividends, we do not find a statistically significant effect on compensation either when considering the economy as a whole or when confining the analysis to dividends in non-financial corporations.[32] With regard to the estimated effect of *FDI* (−0.89 in the MA specification), and given that this indicator stands, on average across countries, at 16.5 per cent in the post-1999 period (whereas it is 1.5 per cent in the first half of the 1970s), increasing capital mobility is likely to have had an impact on compensation of about −0.13 percentage point yearly.

Third, we include *LMI* (Table 7). All the coefficients associated with the proxies for institutions, policies and practices related to the labour market have the expected sign. Trade unions (*TU*), employment protection (both *EPL* and *EPL_T*), collective bargaining coverage (*BC*) and unemployment benefits (*RR*) have a positive effect on compensation growth, with a stronger significance associated to unionization and replacement rates; while indicators of precarious jobs (*TEMP* and *PT*), despite presenting the expected sign, are not significant (this may, however, depend on the low number of observations available). The positive effect of pro-labour institutions is also confirmed when using 5-year moving averages. Overall, these findings confirm that a decrease in labour protection and in the power of institutions in favour of workers enhances capital's bargaining power, making workers reluctant to engage in workplace struggles. As our proxies for *LMI* are constructed on different scales, the coefficients are not directly comparable. Nevertheless, the average unionization rate decreased from 45 per cent in 1970 to 30 per cent in 2018. Similarly, the average *EPL* was about 2.4 at the beginning of the 1980s, while it was approximately 2.0 in the last observed year. Given the estimated semi-elasticities, these losses may have contributed, on average and taken alone, to decelerating the yearly growth rate of the real average compensation by about 0.45 and 0.2 percentage points, respectively.

Finally, we estimate a GM by the variables that emerged as most relevant in the EMs. Table 8 presents alternative specifications, which, together with the growth rate of productivity, consider $\Delta REER$, *RIR*, *UND*2 as indicators of *LMS*, alternative indicators for both *GLOB* and *LMI*, and *FDI* for financialization. Note that in all the specifications estimated here we consider 5-year moving averages as they present a higher explanatory power. The first six columns considering *GLOB* (Models I to VI) broadly confirm the presence of decoupling (which is lower than in the models in which we do not use averages, analogously to Table 3), but there are two differences from the previous results: we find slightly higher (positive) effects of $\Delta REER$ and a negative coefficient associated with *RIR*. The negative effect of all our proxies for trade globalization (*EXP*, *IMP* and *OPEN*) is confirmed when using averages, and import penetration still exhibits a higher coefficient than exports. The higher coefficients of *OPEN* and *RIR* in this model are likely to be due to the improved fit owing to the model's generality in including a variety of dimensions. The two GM

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specifications that consider financialization (Models VII and VIII) confirm the negative effect of *FDI* on the growth rate of compensation in all model specifications.[33]

6.2 | Robustness

The robustness of our findings was tested by modifying our reference models in three directions (see Appendix 3 in the Supporting Information). Specifically, in Table A3.1 of the Supporting Information, we consider different periods, we focus exclusively on the private sector of the economy, we include the unemployment rate in the specification with the GDP-deflated compensation, and we refer to the annual rate of change of the average gross wage only—that is, excluding the value of social contributions paid by employers. In Table A3.2 of the Supporting Information, we run our BM by making use of different estimators. Finally, in Table A3.3 of the Supporting Information, we estimate amended versions of our GM with both 5-year MA and 5-year FA.

In addition to confirming the existence and size of the decoupling, these checks corroborate (i) the negative effect of *LMS*, (ii) the positive effect of *LMI*, and (iii) a negative effect of trade openness when using the 5-year MA. Moreover, some specific indications emerge; the most significant relates to the private sector taken alone (Table A3.1 of the Supporting Information). Here, we find a smaller effect of the unemployment rate and a negative effect of precarious jobs (notably, the coefficient for *TEMP* is negative and statistically significant), although the analysis is confined to a shorter time span and a smaller number of economies.[34] This may indicate a transformation of the labour market in the private sector, which is currently characterized by a larger share of workers whose job has a predetermined termination date, and a consequent negative effect on compensation growth. Remarkably, in the private sector we see a larger decoupling between pay and productivity (with β_D approximately equal to 0.2). Concerning the use of different estimators (Table A3.2 of the Supporting Information), the size of the decoupling is confirmed, while the evidence indicates a moderate (albeit statistically significant) autoregressive component of compensation growth (about 0.2 when using the Arellano–Bond and system GMM estimators). Finally, estimations grounded on the 5-year MA and FA confirm the following: the smaller size of the decoupling when using averaged data (about 0.5) and (marginally) when compensation is deflated with the same price index of productivity; the negative effect of unemployment, trade openness and foreign direct investment (although it is not significant in the FA specification due to the low number of observations); and the positive effect of unionization. Additional extensions of our empirical analyses and robustness tests will be presented in Subsection 6.3.4.

6.3 | Discussion

6.3.1 | General considerations

Our findings indicate that productivity gains have not translated completely into compensation growth. Depending on the different specifications, the pass-through coefficient is about 0.4 yearly and reaches 0.5 when averaging over the cycle. The coefficient is found to be significantly lower in the last two decades and when the analysis is confined to the private sector of the economy. Our empirical results denote that institutional and macroeconomic variables have contributed to wage stagnation and that particular emphasis should be put on labour market slack, worsening labour market institutions, trade openness and international capital mobility in the form of direct

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investments. It is important to note that this evidence is robust to a variety of specifications and to the use of alternative variables capable of depicting the PE dimensions from different angles. It should be noted that our findings reflect the use of the average (instead of median) compensation; this is likely to result in a lower estimate of the decoupling from productivity because the average compensation is affected, to some extent, by the rapid growth of earnings at the very top of the distribution (see Section 2). A further complication in this regard is that the line between capital and labour income can be blurred at these high levels of income (Glyn, 2007).

6.3.2 | Comparison with previous results

A comparison with the results from similar studies is useful for assessing our work and situating it within the existing literature. Concerning the effects of the unemployment rate, our findings are almost completely in line with other explorations (cf. Stansbury and Summers, 2017; Stirati and Paternesi Meloni , 2018; Mishel and Bivens, 2021a, for the US case), while the estimated effects of enlarged measures of labour market slack represent an element of novelty. Our findings are also in line with the negative effects of globalization on the growth rate of wages documented by the literature, although some reverse causality between real wages and the indicators of trade openness cannot be ruled out.[35] As far as *LMI* are concerned, all the selected proxies for the institutions operating in favour of labourers turn out to exert a positive effect on the dynamics of the real average compensation. This may provide further support for the explanation of the decoupling that is grounded on a declining labour bargaining power. As discussed in Subsection 4.4, some econometric contributions have provided mixed results, whereas our results appear to be significant and robust to alternative specifications and proxies for pro-worker institutions.

Discrepancies emerge, however, between our finding of a null role of market capitalization in affecting compensation, and previous studies that document its depressing effect on the labour share (Stockhammer, 2013, 2017; Pariboni and Tridico, 2019). Although differing results may depend on certain differences in the empirical strategy (see below), this remains an open point for interpretation. Another difference regards our finding of a non-significant coefficient for dividends. Here, the explanation may be associated with the fact that we make use of a different representation of this variable, which we consider to be more appropriate.

Differences between our results and earlier research might reflect certain novelties in our methodological approach. First, we consider the growth rate of the real average compensation as our dependent variable (controlling of course for the dynamics of labour productivity), and our focus is on persistent, average changes, whereas the existing literature often investigates the determinants of the labour share and its annual changes, focusing on short-run effects. Second, an additional refinement characterizes our empirical analysis, as we always make use of a full set of country and year fixed effects, whereas other studies control for country heterogeneity only. Accordingly, our exploration is more capable of (i) capturing the influence of aggregate (time series) trends (if any), or possibly omitted variables and (ii) dealing with the coordinated cyclical macroeconomic fluctuations in advanced economies.

6.3.3 | Possible limitations

The major limitation of our work is probably inherent in its very scope, that is, in its aim to assess common features and trends across countries. In this regard, some cross-country heterogeneity

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may exist concerning the sectoral composition of output, policy orientation, exposure to foreign competition, and the institutional and macroeconomic environment. In addition, these features may have undergone change over the selected time span within each country. We mitigate this by systematically using country and year fixed effects, as well as by selecting a pool of quite comparable, high-income economies. In Subsection 6.3.4, we present some empirical tests that further deal with spatial heterogeneity.

We are also aware of some additional limitations to our reference model. As we consider the growth rate of the real compensation for given productivity growth, we cannot rule out the possibility that our set of regressors is associated with the dynamics of the output per person employed. For instance, labour market slack may relate to productivity dynamics as the latter generally presents a pro-cyclical pattern and tends to decrease in downturns.[36] Moreover, our explanatory variables may comove to some degree. Increasing financialization and the 'downsize and distribute' behaviour of big firms may involve higher job insecurity, an increase in bad jobs compared with relatively good ones, and higher unemployment, and these could hence be the channels through which financialization affects distribution (González and Sala, 2013). Actually, the fact that several indicators of financialization are not statistically significant may be related to the fact that it is not easy to disentangle the effects of these variables in an era of labour market slack and growing globalization. Also, increasing financialization and offshoring on the one side, and the process of deunionization on the other side, might not be independent of each other (McCann, 2014). Furthermore, insofar as financialization is regarded by some scholars as crowding out accumulation and productive investments (Stockhammer, 2004; and, from a different perspective, Kliman and Williams, 2015), it may hamper productivity and employment growth. Similarly, increasing globalization and capital mobility may not only have a threat effect by potential offshoring, but may also involve actual de-industrialization and thus higher unemployment (Van Neuss, 2018). Finally, capital mobility—stimulated by the process of financialization—may have led to greater labour flexibility by intensifying international competition (Tridico and Pariboni, 2018). All in all, however, our results concerning the financialization variables might suggest that, if they influence income distribution, this would mainly work through channels such as increasing labour market slack, while international capital mobility (foreign direct investments) may have a direct effect on wage bargaining.

6.3.4 | Additional tests and analyses

To mitigate the limitations discussed above, we extend our empirical analysis in different directions. First, we verify whether the coefficient associated with productivity growth (β_D) varies depending on the workers' bargaining power. For this purpose, we allow for the estimation of a state-dependent decoupling coefficient by introducing an interaction term into our model. Technically, we first construct a categorical variable that identifies country-years of relatively stronger bargaining power of workers; second, we estimate our model of decoupling by following a 'continuous-to-categorical' approach in combining productivity growth and the categorical variable. Accordingly, we estimate the model in Equation (4):

$$\Delta R\_COMP_{i,t} = \alpha_i + \delta_t + \beta_D \Delta R\_PROD_{i,t} + \beta_R RIR_{i,t} + \beta_U UN_{i,t} + \beta_{INT} D \times \Delta R\_PROD_{i,t} + \varepsilon_{i,t} \quad (4)$$

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where β_{INT} is the coefficient associated with the interaction term and D is a dummy variable assuming a value of 1 in the case of country-years featuring a stronger bargaining power of workers (identified according to our discussion in Section 4.) Specifically, we use the country average of certain macroeconomic and institutional variables as a threshold for identifying observations that feature relatively high bargaining power of workers. Accordingly, D is equal to 1 when UN is relatively low; when TU or EPL are relatively high; and in the case of relatively low $OPEN$ and FGL. Results are reported in Table A4.1 of the Supporting Information. Here, the coefficient on productivity growth taken alone has to be interpreted differently: indeed, it represents the share of productivity gains that translates into increasing real compensation in case of *low* bargaining power of workers, while the coefficient on the interaction term captures the higher share of the pie accruing to workers depending on their bargaining power. Findings indicate that low unemployment contributes to increasing the pass-through coefficient by 0.24; high unionization and employment protection by 0.19 and 0.15, respectively; and a positive effect is also associated to low trade openness (0.16). In this analysis, we also find an impact of low financial globalization (0.21). To sum up, this test reinforces the hypothesis that bargaining power is important in altering the distribution of income.

A second strategy envisages the use of an alternative setting that considers the 'gap' between compensation and productivity as the dependent variable. In so doing, we should interpret the regression as modelling the factors effectively influencing that gap (and not the growth rate of compensation alone) even though this specification does not allow us to estimate the pass-through (and complementarily the decoupling coefficient) between productivity and pay, (an element that is central in the reference literature). Notwithstanding this limitation, we re-estimate our model—as in Equation (5)—by focusing on the GAP directly, defined as the difference between the growth rate of the real average compensation and that of productivity. Accordingly, the alternative specification we estimate is the following:

$$GAP_{i,t} = \alpha_i + \delta_t + \beta X_{i,t} + \varepsilon_{i,t} \tag{5}$$

where X represents the vector of regressors (jointly or alternatively used) introduced in Equation (3), β is the vector of estimated coefficients, and where $GAP_{i,t} = \Delta R\_COMP_{i,t} - \Delta R\_PROD_{i,t}$.[37] Table A4.2 in the Appendix of the Supporting Information presents the results for six model specifications. The exploration confirms that the coefficient associated with labour market slack (UN and INV_PT) is negative (and highly statistically significant) in all specifications. Analogously, institutions (TU and BC) present a positive effect and strong significance. As in the previous unaveraged estimates, financialization (MKT) and trade openness ($OPEN$) do not seem to influence the gap. The coefficients associated with PE variables are almost perfectly in line with the models presented in Subsection 6.2, where the dependent variable is the growth rate of the real average compensation (and where the growth rate of productivity is an explanatory variable). This exercise suggests that our regressors do not only explain the existence of the decoupling, but also directly affect its size.

With regard to the issues related to cross-country heterogeneity, these can be mitigated by using an econometric approach that allows for different regression coefficients across countries (namely, for a space-varying β_D). Indeed, a heteroscedasticity and autocorrelation (HAC) robust *delta test* confirms the likely heterogeneity in the decoupling coefficient in our panel (Blomquist and Westerlund, 2013). To deal with this problem, we estimate a fixed-effects individual slope (FEIS) model that explicitly takes into consideration spatial heterogeneity in the *beta* coefficient also—and not only in the constant term (cf. Rüttenauer and Ludwig, 2020). Results are reported in

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Table A4.3 in the Appendix of the Supporting Information and show that the estimated decoupling is perfectly in line with our baseline estimation technique, even when averages and sub-periods are considered.

Somewhat outside the scope of the article, but still dealing with spatial heterogeneity, we also assess if and how the picture changes for groups of countries with different settings in terms of institutions and industrial relations. To do this, we draw from the *Varieties of Capitalism* literature (Hall and Soskice, 2001) and further developments of this approach. Specifically, we apply our GM to countries representative of the liberal market economies (LMEs), the coordinated market economies (CMEs) and the mixed market economies (MMEs), separately.[38] Results are reported in Table A4.4 of the Supporting Information. Unsurprisingly, some differences arise. The largest decoupling is found in LMEs, while a significant coupling holds in MMEs (CMEs settle in the middle of the spectrum). Regarding the depressing effect of labour market slack, this is stronger in MMEs than in the rest of the sample. As far as labour market institutions are concerned, the picture is mixed: their role in stimulating wages in the LME world is not statistically significant, possibly because the conventional indicators are unfit for capturing the evolution of industrial relations within the decentralized wage-setting framework prevailing in these countries. By contrast, a positive nexus is found in CMEs for unionization, bargaining coverage and employment protection; for MMEs, we find a positive sign for employment protection and bargaining coverage, but surprisingly a negative sign associated to unionization. It seems reasonable to consider the latter result as reflecting certain peculiarities within this group in the country-specific combinations of institutional features. For example, France features very low rates of unionization but a bargaining coverage that approaches 100 per cent (along with other pro-labour institutions) and a comparatively very high real wage growth throughout the time span; on the other extreme, Italy exhibits comparatively high rates of unionization, but institutional changes that have progressively eroded trade unions role in wage-setting, and a very low wage growth.[39] As far as the wage-squeezing effects of globalization and financialization are concerned, these appear stronger in LMEs and MMEs.

While suggesting the existence of a certain spatial heterogeneity, this test confirms the relevance of the political economy perspective; that is, it confirms the importance of various institutional and macroeconomic dimensions in affecting workers' bargaining power, although the weight of each one may vary according to the overall institutional setting.

7 | CONCLUSIONS

After a wide-ranging survey of the debates to date, we empirically explored the decoupling between (average) compensation and productivity by introducing some elements of novelty with regard to the literature, such as panel analysis, the systematic introduction of variables representing labour market slack, the focus on 'structural' (average) rather than annual changes and certain methodological refinements and additions. The evidence that we provide confirms, in line with earlier studies, that compensation growth lagged significantly behind productivity growth after 1970 in mature OECD economies: on average and over the cycle, only 50 per cent of increased productivity goes to workers. We also find that the decoupling between the average compensation and productivity is more intense when the private sector of the economy is considered alone, and during the last two decades.

Our findings also provide indications concerning the explanations of the decoupling that are still under debate. We found that the skill-biased technical change argument is not robust

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in explaining the process of redistribution away from labour, as ICT variables appear to be uncorrelated with changes in income distribution. We therefore investigated the possible reasons behind the decoupling through the lens of the political economy approach. Specifically, we assess the effects of some macroeconomic and institutional dimensions, each represented by several variables, on the growth of the average compensation in real terms as our main estimation strategy. But we also take the compensation-productivity gap as our dependent variable, and in addition we explore the impact of selected variables on the link between productivity and pay by estimating state-dependent coefficients on productivity growth.

By means of our empirical analysis, we seek to explain the decoupling by employing several variables—selected on the basis of their economic and statistical significance—to represent dimensions that may have jointly played a role in the erosion of the share of income going to workers. Our results indicate that higher labour market slack and weakening pro-labour institutions appear to have played a major role as wage-squeezing factors: all variables representing these two dimensions are consistently significant. Unemployment growth and declining union density have a large overall impact. When taking into account both the change in their average value over the period and the estimated coefficients, they contributed, respectively, −0.55 and −0.45 percentage points yearly to hampering real compensation growth. The process of increasing commercial and financial globalization, which translated into increasing trade openness and capital mobility (foreign direct investments), has also contributed to the slowdown of the average compensation (−0.3 and −0.13 percentage points, respectively). By contrast, the process of increasing financialization, as measured by growing market capitalization, increasing share of distributed dividends, or increasing foreign assets and liabilities, appears not to have exerted a significant *direct* impact on compensation growth, though the size of foreign assets and liabilities has an impact when we measure a state-dependent coefficient on productivity growth. Finally, we find in general that a real appreciation of the domestic currency has a positive effect on labour compensation; while the negative impact of the real interest rate is not clear-cut, as it emerges only in some specifications.

Compared to previous research, our procedure for selecting relevant variables, the introduction of methodological refinements and several econometric validations render our results robust to alternative specifications and hence a reliable assessment of 'structural' average effects (across countries and over the cycle) of the broad set of dimensions that we have analysed. While consistent with the view of a decline in the bargaining power of workers, our findings enable us to identify the significance and relative weight of macroeconomic and institutional variables in affecting compensation growth and, accordingly, to shed light on the causes of the redistribution away from labour that has occurred in mature economies since the mid-1970s.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study were derived from different resources available in the public domain. Sources are listed in the Supporting Information (Appendix) of the article.

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June 2021); the 33rd EAEPE Conference (2–4 September 2021). We warmly thank two anonymous referees and the Editor for valuable comments and suggestions. The usual disclaimer applies.

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NOTES

[1] Greenspon et al. (2021) suggest a distinction between 'divergence' on the one hand, meaning that productivity growth outpaces real compensation, and 'delinking' on the other hand, implying that productivity growth does not translate into wage increases and hence does not benefit the workers. The difference between the two is in fact a matter of degree: we find that there has been divergence over the entire period we analyse, and (close to) delinking in the last two decades (see Section 6). In what follows, we use the term 'decoupling' or 'divergence' as general terms, while we leave to the estimated coefficients to indicate the degree of divergence *versus* delinking as defined above.

[2] Changes in the labour share may affect aggregate demand—both its composition and its evolution (Onaran and Galanis, 2013; Hein, 2015)—and the composition of the tax base.

[3] It is well recognized that the 'typical worker' pay climbed together with productivity from the post-war period until the late 1970s, whereas they decoupled later. The work by Bivens and Mishel (2015) on the US economy is emblematic. Here, a substantial tie before 1973 is documented, whereas in the period 1973–2014 productivity growth was 72.2 per cent, compared to a +9.2 per cent growth in compensation. Mishel and Bivens (2021a) update this analysis, finding that productivity grew 43 percentage points more than median pay in the United States between 1979 and 2017. A similar trend occurred in European countries and other advanced economies (e.g. Canada and Japan), as attested by the relative stability of the labour share in the 1960s and the first half of the 1970s, followed by a decrease that started in the late 1970s or the beginning of the 1980s (cf. Stirati and Paternesi Meloni, 2021).

[4] While our empirical analyses refer to 'labour compensation', in some specific passages of the article where we deal with theories, such as the present one, we use the term 'wage'.

[5] For empirical evidence supporting this viewpoint, see Girardi et al. (2020) and Stirati and Paternesi Meloni (2021).

[6] This is particularly so owing to the well-known procyclical fluctuations of productivity, mainly related to labour hoarding and overhead labour (Okun, 1962; Basu, 1996), which tend to cause countercyclical movements of the labour share. This may explain the post-2000 recovery of the labour share in some mature countries (France, Italy and, to a lesser extent, Germany) in a context of wage stagnation combined with productivity slowdown.

[7] We recognize this as a potential limitation of our work, as the median compensation (and not the average one) is usually considered representative of the pay of a typical, nonsupervisory worker (Bivens and Mishel, 2015). In advanced economies, the average compensation is generally higher—and in recent decades has grown at a faster pace (cf. OECD, 2018)—than the median one.

[8] The decoupling of the real average compensation from labour productivity amounts to the decline in the (adjusted) labour share if compensation and productivity are expressed in terms of the price of output. In addition, expressing compensation in terms of consumer prices (as we do in most of our empirical analysis, even though we also deflate the average compensation with the product deflator) rather than output prices typically implies slightly larger decoupling because the index of consumer prices has grown at a faster rate than the GDP deflator in most OECD countries (see Schwellnus et al., 2017; OECD, 2018).

[9] Concerning the UK, this finding is confirmed by Pessoa and van Reenen (2013), who reveal no decoupling of the average compensation from productivity and thus no decreasing labour share.

[10] A similar (negative) association between compensation and unemployment is found in other contributions, including Stansbury and Summers (2017), Stirati and Paternesi Meloni (2018), Kiss and Van Herck (2019), Mishel and Bivens (2021a), Sharpe and Ashwell (2021)

[11] According to the neoclassical theory, any reduction in the return to a factor of production would cause greater intensity of its use, that is, in the case of labour, higher labour to capital and labour to GDP ratios (see Bentolila and Saint-Paul, 2003).

[12] Stockhammer (2013) offers a comprehensive survey of contributions to this strand of the literature.

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[13] See Lawrence (2015) for a critical discussion. Although remaining within the neoclassical framework, the author puts emphasis on the limited substitution possibilities between capital and labour.

[14] Along similar lines are the works by Blanchard and Giavazzi (2003) and Bental and Demougin (2010).

[15] Although focusing on rising wage inequality (and not on the erosion of the labour share), the contribution by Kristal and Cohen (2017) deserves to be mentioned as it juxtaposes technological and institutional factors. A similar attempt has been made by Guschanski and Onaran (2022) with respect to the labour share at the industry level in a panel of OECD countries.

[16] Some evidence supports the existence of a long-run relationship between unemployment and participation—and hence does not confirm the unemployment invariance hypothesis—for mature countries (among others, Karanassou and Snower, 2004; Österholm, 2010; Emerson, 2011; Tansel and Ozdemir, 2018). Girardi et al. (2020) also find that economic expansions are followed by a persistent increase in participation.

[17] For a definition of financialization in the broader domain of the social and political sciences, see also Krippner (2005), according to whom financialization can be identified as the growing dominance of capital financial systems over bank-based financial systems. The interested reader may refer to Gospel and Pendleton (2003) for the effects of financial engagement on different types of corporate governance and their consequences for labour management. See also Soener (2021) for an in-depth analysis of financialization processes in the non-financial corporate sector of the economy.

[18] See also OECD (2014b). See Pariboni and Tridico (2019) for a detailed analysis of the multiple channels through which financialization may curb workers' bargaining power and contribute to shifts in income distribution that are unfavourable to wages. On the same issue, see also Hein and Schoder (2011), Lin and Tomaskovic-Devey (2013) and Pariboni et al. (2020).

[19] The use of indicators representing the vulnerability and the shortness of labour contracts (part-time and temporary agreements) may also offer some insights into the relevance of the process of 'structural change' or tertiarization of the economy (Storm, 2017; Beqiraj et al., 2019; Pariboni and Tridico, 2020) in depressing wage growth. The argument is that a shift toward the low-wage segments of the service sector may have contributed to amplifying the decoupling between pay and productivity at the aggregate level.

[20] It should be noted that the effects of wage-setting institutions and practices in reducing income inequality are largely acknowledged in the literature (among others, Wallerstein, 1999; Gautié and Schmitt, 2010; Jaumotte and Osorio-Buitron, 2015).

[21] A further argument can be found in the study by Baccaro and Pontusson (2019, p. 22) with respect to Germany. Starting in the 1990s, the 'collective bargaining system ceased to redistribute productivity across sectors', a feature that had previously enhanced the establishment of a wage-led demand regime, the termination of which weakened the link between collective bargaining coverage and growth.

[22] The panel includes Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, the United Kingdom and the United States.

[23] ICT_CC_C and ICT_CC_C are calculated by the OECD based on growth accounting. For details, see Spiezia (2012).

[24] As discussed in Section 2, the decoupling between average pay and productivity exactly represents the erosion of the labour share when both variables are deflated using the same price index (that is, the GDP deflator). Otherwise, they may not overlap if the trend of the CPI index differs systematically from that of the GDP deflator.

[25] This measure is of course subject to some criticism in a panel environment, as for instance, the different shares of GDP accounted for by different sectors and particularly low-productivity sectors across countries. However, we target a quite homogeneous panel of high-income economies, an element which may reduce this shortcoming.

[26] To consider a large number of dimensions, we choose from a variety of sources and databases. The variables used are all those that are available for a sufficiently long time and for a sufficiently large number of countries. The number of observations may decrease when considering more regressors simultaneously.

[27] As in Stirati and Paternesi Meloni (2021), we multiply the unemployment rate by an index of (average) unemployment duration obtained by dividing the actual duration of unemployment by the country-specific minimum duration.

[28] All the enlarged measures of LMS are standardized (min.–max.) on a common scale (0–10) for coefficient comparison. For the sake of comparability, we also calculate a standardized rate of unemployment (UN_N) on the

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same scale, considering all observations with an unemployment rate lower than 4 per cent (assuming this as a threshold of 'frictional' unemployment) to be a full employment situation (that is, with *UN_N* equal to 0).

[29] We find this measure appropriate because it expresses the unemployment benefit received as a percentage of previous earnings. In our PE framework, higher replacement rates may enhance workers' bargaining power, and therefore positively contribute to wage growth.

[30] As we recognize the potential limitations of stationarity tests in a panel framework, we make use of time fixed effects in all our specifications.

[31] It is worth specifying that, in the specifications with *CRED*, we do not include *RIR* due to potential collinearity.

[32] We also check the robustness of these findings to the exclusion of countries with very high values of *DIV* and *DIV_NFC* (i.e. Luxembourg). The results are virtually unchanged.

[33] The remaining indicators of financialization are not significant even when averaging over the cycle. Moreover, in our GM, we do not include *GLOB* and *FIN* simultaneously due to the systematic presence of collinearity between the indicators representing the two dimensions. Finally, we focus on *EPL* exclusively due to the lower number of observations of *EPL_T*.

[34] Canada, Greece, New Zealand and Switzerland are not included due to data availability. For the same reason, the analysis is confined to the post-1995 period for most of the remaining countries. Particularly in Europe, the period is characterized by high unemployment, an element that may reduce the depressive effect of changes in labour market slack on wages, as documented by Stirati and Paternesi Meloni (2018, 2021).

[35] While some contributions document relevant and significant price-elasticities of export even in a context of high-income countries that are supposed to compete on quality (for a survey, see Paternesi Meloni, 2021), the links among real compensation (our variable of interest), nominal compensation and the level of prices (the relevant variable along with the exchange rate for price competitiveness), are not so tight and not uniform across countries and periods.

[36] We mitigate this concern by including year fixed effects and, in some specifications, by averaging over the cycle.

[37] We verified, as we did for the labour share, that the variable *GAP*, as here defined, does not present a statistically significant correlation with any of the four proxies of technological change or ICT introduced in Section 5.

[38] In doing this, we consider Continental Europe, Scandinavia and Japan as belonging to the CME world; Anglo-Saxon countries as belonging to the LME world; and Southern Europe (including France) as belonging to the MME group (cf. Ferrera, 1996).

[39] See the discussion in Subsection 4.4 for the reliability (and the difference across countries) of alternative indicators of labour market institutions.

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