

DISCUSSION PAPER SERIES

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**How Regulations Impact the Labor
Market: A Review of the Literatures on
Product and Labor Market Regulations**

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Eliana Carranza
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ABSTRACT

How Regulations Impact the Labor Market: A Review of the Literatures on Product and Labor Market Regulations*

This paper provides an extensive review of the literatures on product and labor market regulations and their effects on labor market outcomes. It uncovers the interdependence of these two types of regulations, an area that has received limited attention in research. The paper highlights why understanding the intricate relationship between product and labor market regulations is crucial for effective policy making and advancement of labor market conditions. The findings strongly discourage adopting uniform policies and advocate for tailored approaches to labor market promotion.

JEL Classification: J20, J30, J8, K2, L5

Keywords: labor market regulation, product market policy, employment, wage, productivity, worker protection, firm competition, public policy

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Contents

1	Introduction	4
2	Methodology	7
3	Product Market Regulations	9
3.1	How Do Product Market Regulations Affect Workers?	9
3.2	Promoting Contestable Markets	13
3.2.1	Pro-competitive Product Market Regulation in General	13
3.2.2	Lowering Entry Barriers and Delicensing	18
3.2.3	Liberalizing Markets to Trade and Foreign Participation	21
3.2.4	Distortionary Governmental Policies and Practices	24
3.2.5	Antitrust Law and its Enforcement	25
3.2.6	Synthesis of PMR Promoting Contestable Markets	26
3.3	Liberalizing Firm Operation	27
3.3.1	The Special Role of Upstream Sector Regulations	29
3.3.2	Regulations Affecting Firm Ownership Structures	31
3.3.3	Distortionary Product Market Regulations	32
3.3.4	Synthesis of PMR Liberalizing Firm Operation	35
4	Labor Market Regulations	35
4.1	How Do Labor Market Regulations Affect Workers?	35
4.2	Minimum Wage	38
4.2.1	Minimum Wage: Impact on Living Standards	39
4.2.2	Minimum Wage: Impact on Productivity	48
4.2.3	Minimum Wage: Impact on Social Cohesion	49
4.3	Employment Protection Legislation	50
4.3.1	Employment Protection Legislation: Impact on Living Standards	52
4.3.2	Employment Protection Legislation: Impact on Productivity	54
4.4	Unions and Collective Bargaining	55
4.4.1	Unions and Collective Bargaining: Impact on Living Standards	58
4.4.2	Unions and Collective Bargaining: Impact on Social Cohesion	60
4.5	Mandated Benefits	62

4.5.1	Unemployment Insurance: Impact on Living Standards	63
4.5.2	Unemployment Insurance: Impact on Productivity	67
4.5.3	Unemployment Insurance: Impact on Social Cohesion	67
4.5.4	Pension System: Impact on Living Standards	67
4.5.5	Pension System: Impact on Productivity	69
4.5.6	Paid Family Leave: Impact on Living Standards	70
4.5.7	Paid Family Leave: Impact on Productivity	70
5	Interaction between PMR and LMR	71
6	Conclusion	78

1 Introduction

Regulation plays a crucial role in ensuring efficient and inclusive labor markets worldwide. This review focuses on two distinct streams of the literature, those studying the impacts of product market regulations (PMR) and labor market regulations (LMR), on labor market outcomes. We find compelling evidence that individual regulatory instruments can have vastly different effects in different institutional contexts (Nicoletti and Scarpetta, 2005; Griffith et al., 2007).

The contribution of this paper is threefold. First, it provides a comprehensive review of how PMR and LMR each affect key labor market outcomes, such as employment and wages. When evidence is available, it also considers their potential impacts on society more broadly. Second, it shows that PMR and LMR interact in consequential ways. Understanding these interactions and their consequences is crucial for policy makers seeking to improve labor market outcomes effectively. Third, it brings attention to the existing data and research gaps, highlighting areas where further research is needed for more conclusive results.

Our review encompasses 199 distinct papers or book citations. We focus mainly on papers published in well-known academic journals. Throughout, we aim to include research evidence from countries at all stages of development. However, research on low- and middle-income countries (LMICs) is often less abundant and of a lower quality, primarily due to the scarcity of high-quality data. Therefore, in selected cases we rely on working papers and less academically oriented contributions to shed light on the effects of regulations in LMICs. We stress how a particular regulation can yield different effects across various contexts and urge caution in contextualizing the findings from lower-income countries, which typically feature a sizable informal sector and lower capacity for monitoring and enforcement compared to higher-income countries.

Highlights of the PMR review: In general, the literature on PMR consistently shows that high levels of competition in product markets boost aggregate productivity and consumer welfare. Increased competition ensures resources are used most efficiently, leading to higher productivity. High contestability incentivizes existing firms to adopt better technologies and management practices or exit the market, resulting in more and cheaper production over time, and thus increasing consumption opportunities and welfare. It also promotes economic dynamism and resilience to business cycles.

Furthermore, PMR that promote market competition and contestability also have direct implications for labor markets. The evidence links pro-competitive PMR reforms to increased employment and—to a lesser extent—to real wage increases due to reductions in consumer prices. Moreover, PMR can improve job quality by enforcing production safety measures and fostering sustainable business models, financing options, and management structures. In middle-income countries PMR have also been found to affect the extent of labor market informality.

Finally, we also stress that introducing PMR reforms requires caution. First, the need for such reforms varies greatly across countries. In lower-income countries, entry barriers for domestic firms are less critical than in richer nations. Instead, over-regulated network sectors, uneven conditions for foreign competitors, and distortionary governmental practices are more pressing issues. Second,

PMR reforms can have important spillovers across firms and sectors. Anti-competitive PMR in intermediate sectors, such as network and professional services, and PMR differentiated based on firms' size or ownership structure have been found to be particularly distortionary. However, understanding which types of workers and firms are most affected by reforms can help design appropriate compensation measures and reduce political resistance to deregulation. Third, PMR reforms can incur significant short-term costs, including temporary increases in unemployment as firms may cease operations along the transition toward a new market equilibrium. This regularity may help explain some of the political resistance to product market deregulation. Thus, for a successful policy implementation, it may be helpful to develop a better understanding of which types of workers and firms are most affected by specific PMR reforms so that appropriate compensation measures can be designed.

Highlights of the LMR review: The existing evidence suggests a positive economic effect of more binding, i.e. worker-friendly, LMR. First, the increases in the minimum wage increase the wages of workers at the bottom of the wage distribution with only a small average disemployment effect in the short term, and a disputed impact on employment in the long run. The direction of the employment effect following minimum wage hikes varies with the structure and extent of employer power in the labor market. Monopsonistic industries see employment rises, while competitive industries see declines. Meanwhile, the margin of adjustment depends on exposure to international competition in the product market. Industries more exposed to international competition adjust mainly through employment, while less exposed industries adjust through prices. The minimum wage is recognized as a valuable tool for reducing income inequality and has historically contributed to decreasing income inequality between racial and ethnic groups. In LMICs, it also raises wages in the informal sector, although its impact on informal employment remains inconclusive. Moreover, the minimum wage stimulates aggregate consumption, especially of durable goods, by alleviating household credit constraints. Its effect on productivity appears positive, while its impact on social cohesion is uncertain, with lower crime rates among teenagers but mixed effects on poverty.

Second, the evidence on the effects of employment protection legislation shows that binding employment protection legislation increases job security. More binding regulation, however, has a negative effect on wages and a mixed effect on productivity and unemployment. On one hand, more stringent job protection increases the stock of human capital, contributing positively to productivity, as it offers incentives to firms to invest in training and encourages the accumulation of firm-specific knowledge among protected workers. On the other hand, more stringent job protection slows down labor reallocation, potentially hindering productivity by slowing down the movement of workers from less to more productive activities. In line with this argument, evidence also shows that under specific circumstances, making job protection flexible—for example, by using discretionary rules to retain workers or temporary contracts that provide workers with no job protection—may increase productivity. Introducing flexibility via temporary contracts while maintaining more stringent job protection for permanent workers, however, can result in dual labor markets if temporary contracts are used extensively. Dual labor markets are associated with lower productivity levels. Furthermore, in the context of dual labor markets, more stringent job protection is associated with higher wage inequality, as in practice it only affects a few (permanent) workers.

Third, the evidence associates unions and collective bargaining with higher wages for both covered and non-covered workers, and with lower levels of wage inequality. However, outcomes vary depending on the level at which bargaining takes place. Compared to decentralized bargaining, centralized bargaining leads to higher unemployment, higher average wages, and lower wage inequality among those who are employed. The evidence on productivity is mixed. Centralized bargaining might decrease productivity by preventing labor reallocation to more productive uses, but research suggests no efficiency costs associated with unions in markets with employer market power. Fourth, the evidence on mandated benefits shows mixed effects on employment, wages, and productivity of both unemployment insurance and pension plans. The employment effect of paid family leave is contested, with findings pointing both to long-run positive and negative effects on women's employment. However, paid family leave positively impacts productivity by reducing turnover and increasing labor productivity.

The importance of designing PMR and LMR reforms to be mutually consistent and coherent. Existing evidence suggests that designing PMR and LMR reforms coherently with respect to each other is desirable given the interdependencies between both types of policies.

On one hand, PMR fundamentally determine the intensity of competition in the product market; thus PMR define the framework conditions on which LMR operate. First, by affecting the number of firms demanding labor locally, PMR shape the degree of monopsonistic power that firms have in the labor market. If there is an increase in the statutory minimum wage, industries with monopsonistic competition (in which only a few firms demand labor locally) see employment rises, while industries with more competitive labor markets see employment declines (Popp, 2022; Azar et al., 2023; Corella, 2020). Second, PMR also affect the extent to which firms face international competition. Local firms exposed to international competition face pressure from firms not operating under the same operational and regulatory conditions, affecting the margins of adjustments local firms can use to remain competitive. For example, in the context of a minimum wage hike, industries more exposed to international competition see most of their minimum wage response take place via employment adjustments, while those less exposed pass through most of the minimum wage hike to consumer prices (Harasztosi and Lindner, 2019). The examples are specific to minimum wage hikes, but they apply to other LMR reforms directly or indirectly increasing the cost of labor.

On the other hand, prevailing labor market conditions significantly influence the effects of product market reforms. For example, various papers suggest that stronger LMR, such as worker-friendly policies or centralized bargaining agreements, can amplify the positive effects of product market deregulation on employment (Nicoletti and Scarpetta, 2005; Griffith et al., 2007).

Review structure: We describe our methodology in Section 2, then begin our review in Section 3 with a discussion of how product market conditions matter for labor market outcomes. Since, in a sense, the product market represents the context in which firms and workers meet, PMR also matter for the labor market outcomes that are realized among these parties. In this way, the effects of PMR on labor market outcomes are typically indirect and mediated by the prevailing product market conditions, such as the degree of competition and the flexibility in firms' ownership structures.

After explaining the relationship between product and labor markets in detail, Section 3 goes on to review the effects of classic PMR, which are typically enforced to promote a pro-competitive business environment. Such measures include delicensing production, lowering entry barriers for domestic competitors, opening markets to trade and foreign participation, reducing distortionary governmental policies and practices (in procurement processes, for example), and implementing rigorous antitrust laws. In the second half of the PMR Section 3, we discuss regulations that are typically thought of as liberalizing firm operations, such as reducing size-dependent distortions, making the ownership structures of firms more flexible, and improving competition in intermediate industries in the value chain.

Section 4 proceeds to analyze the effects of various LMR. In particular, it examines the impacts on minimum wages, employment protection legislation, unions and collective bargaining, and mandated benefits. This part of the review strongly builds on previous work by [Betcherman \(2012b\)](#) and as such assesses the effects of each of these regulations in three distinct dimensions: living standards, productivity and social cohesion.

Then, Section 5 brings together the two parts of this paper and discusses the (more limited) evidence on how PMR and LMR interact in reforms. We review both the theoretical and empirical links between both types of regulations, and show how their interaction can attenuate or exacerbate the labor market responses to a reform. We highlight the need for additional research in this field, before concluding in Section 6.

2 Methodology

This paper does not claim to be an exhaustive review of the literature. Rather, it focuses on conveying a comprehensive picture of how PMR and LMR affect labor market outcomes given widely varied socioeconomic, political, and historical contexts. We are interested in a broad variety of labor market outcomes, including employment (both the extensive and intensive margins), earnings (nominal and real), consumption, inequality, social cohesion, (relative) labor productivity, and finally—alluding to the structural transformation literature—the allocation of labor across various sectors and firm types. Whenever the literature provides sufficient evidence, we also allude to how the regulations affect different types of workers (for example, by gender, age, and skill group) and over varying time horizons.

Usually, the academic literature analyzing the effects of PMR is not primarily concerned with how they affect labor market outcomes directly. Instead, its main focus is on how they alter product markets and their competitiveness, which is reflected in prices, mark-ups, the number of firms, and—sometimes—in overall employment. However, changes in product markets have direct implications for a broader range of labor market outcomes and the welfare of workers in their role as consumers. For example, given stable nominal wages, lower prices of goods imply a rise in real wages. Some papers are explicitly concerned with disentangling such linkages, but most of them focus on regulations' effects on product market indicators. When reviewing the literature on PMR and their effects on labor market outcomes, we thus distinguish between papers that look at *direct*

versus *indirect* linkages. In contrast, given the nature of LMR, their effects on labor market outcomes can be directly assessed.

Regarding the temporal scope of our review, we tend to prioritize more recent evidence because of its timeliness and because data quality tends to improve over the years. The part reviewing the effects of PMR does not impose a lower bound on a paper's year of publication given that, to the best of our knowledge, there has not yet been a previous comprehensive literature review written about the effects of PMR on labor market outcomes. In contrast, the part reviewing the effects of LMR builds on multiple previous reviews, notably that of [Betcherman \(2012b\)](#), who reviewed the evidence on various regulation types until 2012. In a way, the LMR part of the paper can thus be thought of as an update of [Betcherman's \(2012b\)](#) work as it gathers evidence written during the past decade on the effect of LMR on economic outcomes such as living standards, productivity, and social cohesion. Compared to [Betcherman \(2012b\)](#), the present study extends the review of mandated benefits beyond paid family leave to also include pension and unemployment insurance schemes as evidence on these two policies is readily available. It also extends the considered outcome variables to capture living standards, productivity, and social cohesion, in line with the trend to consider a wider set of outcomes in the recent literature.¹

Given that the effects of regulation are highly context-dependent, we pay particular attention to maintaining a broad geographic scope. This means that we move beyond the high-income country setting for which there is typically high-quality and available data. For academic evidence on high-income countries, we typically only consider evidence from highly ranked peer-reviewed journals. The evidence on LMICs in these journals is less extensive, and to obtain a more representative picture in terms of geographic scope, we lower our selection requirement for papers that provide information on LMICs regarding their place of publication and objective data quality. We do not restrict our analysis to papers employing any particular methodology and include both empirical and theoretical research.

Figures 1 and 2 map the literature covered in this review by type of regulation and outcomes studied. Figure 1 depicts all 79 papers cited in this review that study the effects of PMR on product market and/or labor market outcomes. Each column corresponds to a type of PMR, covered in Section 3.1 of this review. A paper only appears once per column. Each row flags the different outcomes the review focuses on, with product market outcomes that affect workers *indirectly* in the top half (in yellow) and *direct* labor market outcomes in the bottom half (in green).

Among the reviewed PMR papers, the most common types of regulations considered are those that promote competition in general, or by lowering entry barriers and delicensing production in particular. The role of distortions introduced by certain types of PMR (for example, size-dependent policies) is also a relatively common aspect studied in the literature. In contrast, we only found two

¹Even though there is a growing literature on the effects of labor regulation on health, with relevant implications for well-being and living standards, this review leaves out both physical and mental health. Other labor market regulations, such as active labor market policies, and other forms of regulation that could be interpreted as affecting the labor market, such as immigration restrictions, are out of the scope of the present review (see [Clemens et al. \(2018\)](#), [Donovan and Schoellman \(2021\)](#) for two recent references on the topic). We also leave out pay transparency legislation (see [Cullen, 2023](#), for a recent review, finding that although pay transparency can address information frictions, it may result in unintended consequences for workers).

economics papers that explicitly study the effects of antitrust law and its enforcement on product and labor market outcomes. The most frequent outcomes analyzed in the papers include the competition level in an economy, the aggregate employment effects, and the reallocation of production across industries and sectors. In contrast, many typical labor market outcomes, such as earnings inequality and employment effects on particular groups, are rarely studied. Among all 79 PMR studies, only about half (33) directly measure outcomes for workers.

Figure 2 charts out the LMR evidence. In contrast to Figure 1, this map focuses exclusively on LMR outcomes (in green). This aligns with the goals of our study: to review the effects of regulations on labor markets while keeping in mind that some indirect effects also act through the product market side. The columns in Figure 2 match the different types of LMR studied in Part 4 of this review. As expected, we find a larger number of LMR than PMR studies that outline the implications for workers: Figure 2 depicts 114 papers (which, as described above, were all published after 2012 and do not include the studies in [Betcherman \(2012b\)](#)). Minimum wage studies are the most common type of LMR studies (62 papers), followed by mandated benefit studies (26). In contrast, the effects of unions and collective bargaining (8 studies) have been rarely studied since 2012. Common outcomes include employment effects, earnings, and labor reallocation; while migration, consumption, prices, and social cohesion are less-frequently considered outcomes. It should be noted that many of these labor market outcomes could be directly linked to changes in the structure of product markets (for example, labor reallocation across sectors). However, the LMR papers we reviewed rarely explicitly discuss such linkages and focus on the implications of a given reform on workers.

Throughout this review, we highlight the various channels through which PMR and LMR affect workers, noting that their relative importance is highly context-dependent. On one hand, the level of development of countries plays a substantial role. For example, in LMICs, where enforcement capabilities are typically low, minimum wage rules may have less bite than in high-income countries. On the other hand, the pre-existing regulatory framework may matter for how new regulations act upon the local labor market. For example, changes in PMR affecting firms' mark-ups may lead to different employment effects depending on the LMR in place, given that the latter co-determines the relative price of labor. When pro-competitive regulation lowers mark-ups, firms typically increase their overall production and employ additional workers in order to do so. However, when labor is relatively more expensive than capital, this increase in employment will be lower than if it were the other way around.

3 Product Market Regulations

3.1 How Do Product Market Regulations Affect Workers?

The most prominent way in which PMR affect labor market outcomes is by altering the degree of competition in an economy (see for example, [Dauda, 2020](#)). In the presence of strong market power by individual firms, production quantities are often artificially restricted due to rent-seeking,

Figure 1: Overview of papers by type of PMR

		Type of Product Market Regulation (PMR) studied in a paper										
		Promoting contestable markets					Liberalizing firm operation					Number of papers looking at each outcome
		Pro-competitive PMR in general	Lowering entry barriers and delicensing	Liberalizing markets to trade and foreign participation	Distortionary government policies and practices	Antitrust law and its enforcement	Distortionary PMR	Regulations affecting firm ownership structures	The special role of upstream sector regulation	Mix of two or more PMRs		
Type of Product Market Outcomes		Business Resilience/ Sustainability/ Innovation	1	5	0	0	0	2	2	3	8	
Competition (national)	10	12	2	0	3	1	0	6	8	32		
Competition and FDI (cross-border)	2	0	9	0	0	2	0	1	6	18		
Informality	1	4	0	0	0	1	0	0	1	6		
Interaction PMR and LMR	5	3	1	0	2	1	1	0	1	9		
Investments	2	2	2	0	0	4	2	3	6	19		
Reallocation between sectors/ firms	3	6	3	2	0	7	1	2	2	23		
Implications for workers (added in bottom half if yes)		15	10	8	1	3	3	2	2	5	34	
Type of Labor Market Outcomes		Consumption	5	5	3	0	2	1	0	0	2	13
Employment	13	9	8	1	0	2	1	1	5	27		
Employment (particular groups)	1	5	4	1	0	0	0	0	0	10		
Labor earnings	7	4	4	1	2	2	1	1	3	18		
Labor earnings (particular groups)	0	5	2	1	2	0	0	0	0	10		
Labor earnings inequality	2	2	1	0	1	0	0	0	0	4		
Labor reallocation	3	6	2	1	0	4	0	1	2	16		
Productivity and Training	6	1	2	0	0	2	3	2	3	13		
Social cohesion	0	0	2	0	0	0	0	0	0	2		
Number of papers studying each type of PMR		16	15	10	2	3	10	4	6	13	79	

Total number of (unique) papers = 79. Each study appears only once per column. Most studies appear in more than one row as they look at multiple outcomes.

Figure 2: Overview of papers by type of LMR

		Type of Labor Market Regulation (LMR) studied in a paper					Number of papers looking at each outcome	
		Minimum wage	Employment protection legislation	Unions and collective bargaining	Mandated benefits	Mix of two or more LMRs		
Type of Labor Market Outcomes	Consumption	8	0	0	3	1	4	
	Earnings	30	5	4	12	2	53	
	Earning differentials and heterogenous effects	11	1	0	2	3	17	
	Earnings inequality	14	0	2	0	3	19	
	Employment effects	34	8	3	17	4	66	
	Employment, heterogenous effects	19	2	0	9	4	34	
	Hours worked per worker	4	0	0	2	0	6	
	Labor reallocation	13	4	1	6	3	27	
	Migration	2	0	0	0	0	2	
	Output	5	2	1	2	0	10	
	Prices	5	0	0	0	0	5	
	Productivity and Training	12	7	3	3	3	28	
	Social cohesion	6	0	0	2	1	9	
	Number of papers studying each type of LMR		62	12	8	26	6	Total number of papers = 114

Total number of (unique) papers = 114. Each study appears only once per column. Most studies appear in more than one row as they look at multiple outcomes.

resulting in higher prices than those that would be expected in a competitive market setting. Increased competition on the product market impacts workers in four ways: Firstly, increased competition will lead to more production, which increases the demand for labor (Blanchard and Giavazzi, 2003). Secondly, competition decreases the prices that producers can charge for their output and thereby decreases the marginal return of labor, which is reflected in lower (nominal) wages (Spector, 2004). In the longer term, this effect can be counteracted by accelerated technological progress that competition is said to favor (see for example, Marino et al., 2019). If production technologies improve, they will increase the marginal return of labor and put upward pressure on wages. This constitutes the third channel through which competition affects workers' conditions. Finally, it is important to remember that employees are not only workers but also consumers. In this fashion, lower prices of consumption goods will increase the number of products that can be afforded with a given nominal wage, implying an increase in real wages through the consumption price channel (Blanchard and Giavazzi, 2003; Spector, 2004).

This review considers PMR broadly, including regulatory instruments, institutions and common practices. In this spirit, besides emphasizing how regulations change labor market outcomes through the angle of competition, we also assess how they can act through the angle of altering firm operation. Concretely, we consider regulations that affect the allocative efficiency of resources across firms and sectors, the ownership structures of firms, and the availability of intermediate goods. All these types of regulations can also have substantial effects on labor market outcomes.

Throughout this review, we refer only selectively to the abundant literature on how PMR affect standard product market outcomes (such as firm mark-ups or prices). Instead, we take special care to explain the qualitative mechanisms through which these product market conditions matter for labor market outcomes. Our main focus is to present the relatively small literature that emphasizes the effect of PMR on labor market outcomes. Among these, we distinguish between living standards (including employment, labor earnings, and consumption), labor productivity, and social cohesion.

How PMR matter for labor market outcomes is highly dependent on their institutional context and implementation (Nicoletti and Scarpetta, 2005). Some of the activated mechanisms can offset each other, leaving the overall effects of a regulation unclear. In addition, PMR can have different effects on various types of workers (for example, formal versus informal, or skilled versus unskilled). Finally, there is sometimes evidence of temporal trade-offs. For example, the effects of increased competition are negative on employment and/or real wages in the short run and turn positive in the longer run (Bouis et al., 2020; Cacciatore and Fiori, 2016; Gal and Hijzen, 2016; Griffith et al., 2007). We highlight evidence on these aspects whenever they are mentioned in the reviewed papers.

The following review of PMR is structured in two main parts. Firstly, Section 3.2 deals with regulations that are directly associated with the level of competition in an economy. It reviews the evidence on individual pro-competitive PMR in detail, and takes stock of these findings in Subsection 3.2.6. Secondly, Section 3.3 presents the evidence on the effects of PMR that affect labor markets by conditioning firm structures and operations. After reviewing the regulations affecting correlated distortions, firm ownership structures, and upstream sectors, it summarizes these findings in Subsection 3.3.4.

3.2 Promoting Contestable Markets

The goal of this section is to review the literature on PMR that strengthen or hinder market contestability. Contestable markets are considered to feature relative ease of entry, growth, and exit of firms in the economy without being distorted by anticompetitive legislation or governmental practices (Islam et al., 2022). Contestable markets are generally associated with increased competition, which entails direct implications for aggregate employment, wage levels, and productivity growth through the mechanisms outlined in the previous section.

In Subsection 3.2.1, we present evidence of how pro-competitive policies affect labor market outcomes in general, without distinguishing between specific regulations. This section mainly comprises theoretical and high-level empirical papers that rely on aggregated indicators of regulatory stringency. In Subsections 3.2.2–3.2.5, we examine more specific PMR that affect workers by altering the degree of competition on product markets. We begin by reviewing the role of entry barriers and licensing in Subsection 3.2.2. Next, in Subsection 3.2.3, we turn to regulations conditioning trade and foreign direct investment (FDI). We then summarize the evidence on the effects of distortionary governmental practices, before discussing the importance of well-designed and enforced antitrust laws in Subsection 3.2.5. Finally, in the last subsection, we take stock of the evidence and summarize what we know about how pro-competitive PMR affect labor market outcomes.

3.2.1 Pro-competitive Product Market Regulation in General

A seminal theoretical contribution to the field of PMR is Blanchard and Giavazzi (2003). They develop a model with monopolistically competing firms and households that afford consumption through wages earned as workers. The model captures PMR as firm entry costs that reduce total rents. Lowering these entry costs increases firm production and employment in the medium to long run. At the same time, the decreased firm rents lead to downward pressure on nominal wages. The latter effect is, however, alleviated through lower prices of the consumption goods, i.e. an upward pressure on real wages. Overall, workers gain more as consumers than they lose as workers, which makes deregulating product markets beneficial even in the short run.²

In Spector (2004), the intensification of product market competition increases employment but may cause real wages to fall in the short and long term. Some key differences relative to the work of Blanchard and Giavazzi (2003) are that production features decreasing returns to labor and that PMR is modeled as a restriction on the number of quantities that each firm is allowed to sell in an economy. In the short run, the number of firms is fixed and exogenous, but in the long run, capital flows in and out of the country to ensure that firms' profits do not change, causing adjustments in the number of firms. An increase in product market competition causes employment, aggregate welfare, and the labor share in production to rise in the short run. Whether the real wages rise or

²If more competition is instead achieved through an increased substitution elasticity of demand, this will, in the short run, imply lower mark-ups for firms and higher employment levels and real wages for workers. In the long run, however, the number of firms in the market will adjust, leading to fewer firms in equilibrium that charge the original pre-regulation mark-up. Hence, the unemployment rate and the real wage return to their initial steady state. A key takeaway from Blanchard and Giavazzi (2003) is thus that the way in which more competition is achieved matters crucially for longer-term outcomes.

fall depends on the relative bargaining power of firms and workers in the economy. In the long term, the following happens: If workers have low bargaining power, increased product market competition causes real wages to rise. In contrast, if LMR is high, more competition can cause real wages to fall. In related work, [Ebell and Haefke \(2009\)](#) show that product market deregulation can decrease unemployment and increase real wages. As in [Spector \(2004\)](#), they clearly show how these effects depend on the semi-elasticity of wages with respect to firm surplus.

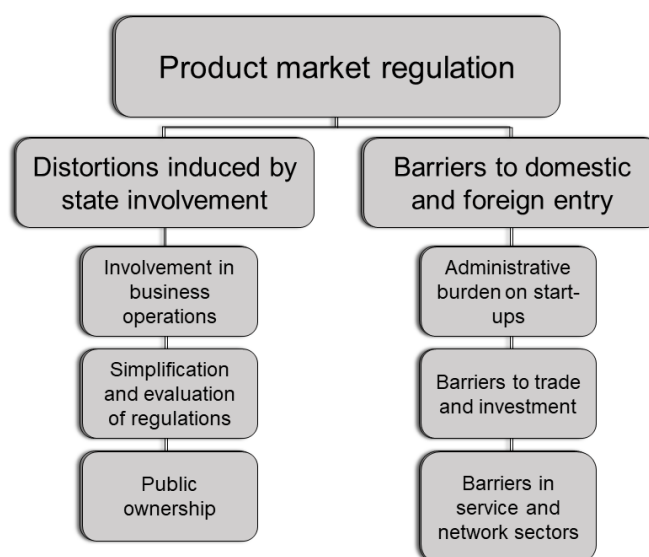
[Fang and Rogerson \(2011\)](#) propose a model, that highlights the endogeneity of workers' labor supply decisions, which are characterized by a trade-off between consumption and leisure time. When product markets are deregulated, i.e., entry costs for firms are reduced, the employment effects of the reform are determined by whether the net returns to market work increase. This, in turn, depends on the precise implementation of the reform (for example, does the government redistribute the additional revenue obtained due to the charged firm registration costs?). How strong the increase or reduction in aggregate employment then depends on whether the substitution effect or the income effect dominates.

Infobox: The OECD PMR Indicators

Since 1998, the Organisation for Economic Co-Operation and Development (OECD) has produced the Product Market Regulation (PMR) indicators. These are a comprehensive and internationally comparable set of measures for the degree to which policies promote or inhibit competition in the product market. The indicators are based on an extensive database, which is compiled by the OECD and relies on time-specific answers to a questionnaire that is sent to national authorities.

The information is quantified in a large series of individual indicators whereby the most competition-friendly value is zero and the least 6. Through a bottom-up approach, these indicators comprise the basis for broader PMR indicators at a sector-specific and economy-wide level. It should be noted that the OECD's PMR indicators are comparable across countries due to their *de jure* nature. However, their comparability is limited due to the various *de facto* implementations of these laws across countries.

In a recent summary of the empirical competition literature, [Hong \(2022\)](#) reviews the effects of competition policy on three key macroeconomic outcomes. He concludes that pro-competitive policies lead to productivity growth, a positive effect on total employment and real wages in the medium to long term, and reduced income inequality. A working paper by [Causa et al. \(2015\)](#), reaffirms the inequality-reducing effects of product market deregulation, highlighting the positive effects on households' disposable income.



Source: Adapted from Vitale et al. (2020). Further information is available on the OECD web page: <https://www.oecd.org/economy/reform/indicators-of-product-market-regulation/>

Throughout the empirical literature, the OECD PMR indicators are a prominent measure of the regulatory stringency on product markets over time, as well and across countries and sectors (see box). A path-breaking empirical contribution based on these indicators is Nicoletti and Scarpetta (2005). Their regression analyses suggest that a reform decreasing the countrywide PMR indicator, from the most regulated to the most deregulated OECD country, would increase long-run employment rates by between 2.5 and 5 percentage points. The authors also show that the estimated effects of deregulating product markets is stronger when labor market policies and regulations are more worker-friendly.

Similarly, Bassanini and Duval (2009) find that product market deregulation decreases the unemployment rate in the average OECD country. They report that a typical historic reform of the average PMR (1 indicator unit) would lower the unemployment rate in the average OECD country by about 0.5–0.7 percentage points. This finding is robust across different specifications, choices of the estimation sample, data, and econometric methods, including treatment of possible reverse causality. Like Nicoletti and Scarpetta (2005), the authors note that deregulatory product market reforms decrease unemployment more when the overall regulatory framework is more employment-friendly.

A related paper is Griffith et al. (2007), which relies on indicators of product market reforms that affect both traded and non-traded sectors of the economy. They use these reforms to instrument the degree of competitive pressures that firms are exposed to. They find that a 3-percentage-point drop in average firm profitability due to deregulatory product market reforms will decrease the unemployment rate by 0.51 percentage points and increase real wages by about 3.4 percent.³

³This 3-percentage-point drop in average firm profitability was predicted for the UK market entering the European

Research on the employment effects of PMR has repeatedly found that the institutional and economic context in which pro-competitive reforms are enacted matter greatly for their effect size and direction (Vitale et al., 2020). Bordon et al. (2016) show that the employment effect of product and LMR varies dependent on the macroeconomic context of the reform implementation. Using local projection methods and reform shocks based on OECD PMR indicators, they find that product market deregulation leads to positive effects on employment (significant after 2 years), which becomes larger and more significant until year 5. In a second step, they include an interaction of the reform variable crossed with a measure of the business cycle at the time of the introduction of the reform. Product market deregulation launched during “good times” has an immediate positive and significant effect on the employment rate. They do not have statistically significant effects on employment in “bad times.” This reassuringly implies that the additional supply capacity created by structural reforms will be absorbed even when aggregate demand is weak and does not necessarily lead to deflationary pressures. The authors also find more positive effects on employment when reforms coincide with non-restrictive monetary policy.

Again relying on recent OECD PMR indicators data, Piton and Rycx (2019) find that an average product market reform over 1998–2013 is associated with a one percentage point reduction in the unemployment rate. Interestingly, highly educated individuals seem less impacted than low- and middle-educated workers. In contrast, men and women are equally affected by deregulation. Such heterogeneous effects on different worker types are also addressed in De Serres et al. (2012), who find more pronounced effects for women and youth, two groups considered vulnerable population subgroups at times of crisis. Their paper emphasizes how decreased regulation of product markets helps make economies more resilient to shocks. They show that more competition-friendly PMR can reduce structural unemployment while raising turnover. Such regulations also seem to decrease the persistence of unemployment.

A common element of all research presented above is that more pro-competitive PMR are associated with increases in aggregate employment. Some papers reassess this finding by estimating local projections based on different data, i.e. not the OECD PMR indicators. Duval and Furceri (2018) rely on a narrative database on labor and product market reforms in 26 advanced economies since 1970 to construct regulatory shocks. They find that past product market deregulation shocks increased GDP by about 1.5 percent on average after 5 years. This positive impact becomes statistically significant only after 3 years and fully materializes after about 7 years at 2.25 percent GDP growth. They find no significant effects on employment and labor productivity. In addition, the authors find that the effects of product market reforms do not depend significantly on the business cycle conditions, which stands in stark contrast to their own findings for labor market reforms.

Using the same narrative reform data, Bouis et al. (2020) shed light on the differential effects of PMR deregulation in the short versus long run. Using local projection methods, they find that output effects become significantly positive only 3 to 4 years after the reform, as prices start dropping. They do not find evidence of any transitory cost, apart from a short-lived drop in

Single Market Program.

employment during the year of the reform. A typical reform in their sample increases real value added in the deregulated industry by about 10 percent after 5 years. Real wages increase significantly while labor productivity and employment increase, but these increases are borderline insignificant.

Some papers are concerned with heterogeneous responses to product market deregulation across sectors. [Gal and Hijzen \(2016\)](#) use a local projection approach and find that, on average, such deregulatory reforms raise firm capital by 4 percent, output by 3 percent, and employment by 1.5 percent after 2 years. These effects do, however, differ across sectors. Although most reforms occur in the service sector, they benefit firms' output in retail trade and professional services at least as much as those in the service sector itself, indicating important downstream spillovers. Furthermore, the authors find evidence that within sectors, it is usually the most efficient firms that benefit from deregulation. In network industries, small firms tend to increase employment most, while larger incumbents react by downsizing. In retail trade, large businesses tend to benefit more than smaller ones. There are no significant differences across firm sizes in the professional service sector. However, the authors document an important role of credit constraints, which significantly weaken the positive impact of product market reform on firm investment.

[Messina \(2006\)](#) also highlights how PMR are connected to the sectoral employment patterns, and relates this to observed structural change dynamics across countries. Regressing countries' service sector employment share on the degree of OECD PMR indicators suggests that a reduction of one standard deviation in entry barriers would result in a 1.6 to 2.3 percentage points increase in the service employment share for an average income country in the sample. Calculations imply that differences in regulations can account for about one-fifth of the cross-country differences in service sector employment shares after controlling for income levels. Against this background, the paper builds a model featuring non-homothetic preferences in agriculture and services, monopolistic competition in all three sectors, and differences in the rate of productivity growth across sectors. Product market regulations enter in the form of economy-wide fixed costs that all firms must pay in every period. Increases in regulatory costs obstruct the natural pattern of structural change, hindering the development of those sectors whose demand is more income-elastic, i.e., especially the service sector. In a counterfactual model exercise, the author lowers the regulatory barriers from OECD to US levels. EU countries would experience a 3.8 percent increase in overall employment, a 1 percent increase in their service employment share, and a 1.04 percent gain in welfare after this reform.

Finally, there is some research analyzing how pro-competitive PMR matter across business cycles. The [OECD \(2018b\)](#) uses the term dynamic efficiency to describe the fact that product markets become more flexible as competition increases. When entry barriers are lowered, new firms often bring in new ideas, while incumbents face incentives to innovate. Relatedly, research has documented that well-designed regulations can improve the resilience of labor markets to adverse economic conditions. Intuitively, when markets are less constrained by procedural rules and entry/exit barriers, they can operate more smoothly, finding faster solutions to overcome moments of crisis. For example, [De Serres et al. \(2012\)](#) show that unemployment after crises is less persistent

in OECD economies with less regulated product markets, which has direct implications for the welfare of a country’s workforce. [Cacciatore and Fiori \(2016\)](#) find that product market deregulation reduces the welfare costs associated with business cycle fluctuations in EU countries. [Islam et al. \(2022\)](#) flag the lack of dynamism induced by PMR as one explanation behind the stagnation of labor markets observed in MENA countries.

Much of the empirical work cited above relies on the PMR indicators carefully compiled by the OECD. These measures do usually not exist for LMICs for at least two reasons. On the one hand, collecting data from (formal) firms in LMICs is more cumbersome due to a lack of accessible infrastructure. On the other hand, OECD PMR indicators only measure *de jure* conditions and do not provide information about the *de facto* states under which firms operate. In LMICs, where law enforcement is often much weaker than in advanced country settings, such indicators are less useful. In the upcoming sections, we discuss different regulation types in more detail. We include several papers that review the implementation of specific regulations in the context of LMICs.

3.2.2 Lowering Entry Barriers and Delicensing

The ease with which new firms can enter a market is a decisive factor for the level of product market competition in an economy. In a recent report, [Vitale et al. \(2020\)](#) point out that the firm registration process is still overly complex in many (OECD and non-OECD) countries, which continue to use licenses and permits and do not have a “silence is consent” rule to speed up the administrative process. In addition, the authors promote introducing one-stop shops that can provide businesses with information on all licenses and permits, and that can issue all of them. Interestingly, LMICs seem to face this problem to a lesser extent than rich countries, given that they often either have no formal processes—or relatively uncomplicated ones—for standard entrants. In Indonesia, for example, [Lewis et al. \(2022\)](#) praise the general low complexity of regulatory procedures, as well as the simple language in the communication of new regulations. In 2018, the Indonesian government further simplified obtaining licenses and permits for businesses. In addition, there is now an online one-stop shop that allows completing most licensing requirements online. In Kazakhstan, the [OECD \(2018a\)](#) notes that new domestic firms can enter the Kazakh market relatively simply by obtaining all licenses and permits in a single visit to an official center. In contrast, foreign firms still have relatively cumbersome entry procedures characterized by low automation and poor information availability.

Regarding theoretical models, firm entry barriers are the most common way of including anti-competitive regulations in the model framework. They mostly come in the form of fixed costs that firms need to pay to start operations (see, for example, [Blanchard and Giavazzi, 2003](#)). In most models, as discussed in Section 3.2.1, lowering entry barriers proves beneficial for workers due to increases in employment or real wages in the longer run. While the mechanisms at play are usually more explicit when analyzed through the lens of a model, this section will discuss empirical findings based on the evaluation of actual reforms to entry barriers. This allows for a more realistic picture of past experiences, as well as a better sense of the magnitude of the results.

In OECD countries, [Piton and Rycx \(2019\)](#) identify reductions in barriers to entrepreneurship as the

most important type of product market reform measured by its contribution to aggregate employment. The average level of reforms reducing entry barriers between 1998–2013, as measured by the OECD PMR indicators, is associated with a statistically significant reduction in the unemployment rate by 1.4 percentage points. In contrast, reducing barriers to trade and investment and lessening state control play a much smaller role. [Bassanini \(2015\)](#) discusses the effect of lowering entry barriers on industry employment in the short term and focuses his analysis on three network industries in 23 OECD countries. He stresses that these sectors are characterized by large incumbent firms, which are more likely to immediately engage in reorganization and reduction of overstaffing after deregulation than other industries, which are dominated by small firms. This mechanism can be thought of as incumbents’ attempt to achieve entry-deterrence, making their production more cost-efficient before the entry of new competitors. By estimating local projection models, [Bassanini \(2015\)](#) indeed finds non-negligible negative short-term effects on employment. A decrease in the entry barriers proxy of 1 point, a relatively large change only observed in about 5 percent of the sample, leads to a decrease in industry employment of 0.6–2.5 percent. This effect vanishes only 4 years after the reform. The initial decrease in employment is accompanied by a rapid fall in prices by 0.6 percent and an increase in labor productivity by 1.7 percent.

In what follows, we outline the implications that some explicit policies hindering firm entry have on competition and labor market outcomes. [Bertrand and Kramarz \(2002\)](#) exploit a quasi-random variation in the entry regulation on the French retail market, finding evidence that stronger entry deterrence reduces employment growth. Exploiting variation in approval rates of new retail business registrations by regional zoning boards, they find evidence for increased concentration and prices charged by retailers in more regulated areas. In a counterfactual exercise, they show that moving a department from the first quartile of the approval rate distribution (about 30 percent) to the third quartile (about 50 percent) would imply at least a 7-percent increase in retail employment. Distinguishing between worker types, they document a slight negative effect of higher entry barriers on female employment shares.

[Cooke et al. \(2019\)](#) analyze an “On the Spot Firm” program introduced in Portugal in 2005, which reduced the time, cost, and bureaucracy of new business registrations. They find that the female employment share grows strongly after the reforms, particularly in managerial and high-skill positions, both within firms and across firms in an industry. They also obtain a positive and statistically significant differential effect of the reform on the pay of female workers, reducing the gender pay gap by 1.7 percentage points for middle managers and high-skilled workers and by 1 percentage point for medium-skilled workers. Finally, they also report that non-discriminatory employers, approximated by a larger female employment share, increased employment more after the reform than discriminatory employers. The latter also exhibits a higher probability of exiting the market following the reform, which is in line with the dynamic efficiency argument by the [OECD \(2018b\)](#). [Branstetter et al. \(2014\)](#) examine the same reform and estimate that the program increased the number of new firms per 10,000 county inhabitants by around 17 percent and created around 7 additional jobs per month. However, they show that the new firms are mostly marginal firms, which are mainly small, operate in low technology sectors, and are less likely to survive than non-marginal firms. They are also run by less-educated, more female, and older entrepreneurs. Some

evidence indicates that they also are less productive and pay lower wages.

[Bruhn \(2011\)](#) examines the effect of a business registration reform in Mexico. Starting in 2002, the Rapid Business Opening System (SARE) significantly accelerated the process that firms needed to go through to register. Bruhn implements a difference-in-differences design and estimates decreases in the consumer price level by about 1 percent in eligible industries, implying revenue losses for incumbent firms. At the same time, the reform increased the number of new business registrations by 5 percent and the fraction of wage earners by 2.2 percent in eligible industries. Finally, there is some evidence that newly registered firms are not previously existing informal firms, but instead, new firms created by former wage earners. A follow-up paper challenges this last result. [Kaplan et al. \(2011\)](#) argue that many newly registered firms were already established informal firms before the introduction of SARE. Measured by their number of employees, the new firms registered after the reform are about twice as large as those registered before SARE, speaking to a different nature of “new firms.” Post-SARE registered firms are also less likely to exit the market than firms that registered prior to the program. This finding contradicts [La Porta and Shleifer \(2014\)](#), who conclude that lowering registration costs for formal firms neither brings many informal firms into the formal sector nor unleashes economic growth. Instead, informality will only become a less important part of the economy as the formal sector becomes increasingly productive.

Concerning further evidence from the SARE reform in Mexico, [Kaplan et al. \(2011\)](#) find effects of a similar size as those in [Bruhn \(2011\)](#) regarding the number of new firm registrations, which appear to be concentrated in the first 15 months after the reform. In addition, they show that the new jobs were mainly created in small new firms leading to small aggregate employment effects.

Adding to the discussion about entry barriers in the retail sector, [Busso and Galiani \(2019\)](#) conduct a randomized controlled trial in the Dominican Republic by collaborating with a local conditional cash transfer program that serves the needs of its participants by financing debit card purchases in affiliated supermarkets. The authors build on this setting and randomize the entry of additional supermarkets into the network of stores affiliated with the program. They find that allowing for additional entry leads to reductions in prices ranging from 1.9 to 6.0 percent and to a statistically significant improvement in the service quality reported by households. In this sense, higher levels of competition increase consumer welfare through multiple channels.

In LMICs, entry regulations in the form of firm registration and tax costs are often thought of as affecting the aggregate levels of formality in the economy. To the extent that firms’ formality affects workers’ job quality, this represents an important labor market outcome. [Charlot et al. \(2015\)](#) build a model with a formal sector and an informal sector where, compared to formal firms, informal ones feature lower entry and operational (tax) costs, lower productivity, and match workers more easily on the labor market. The authors calibrate the model to a typical low-income country and show how lowering entry costs for the formal sector affects aggregate unemployment. They show that a fall in PMR that reduces informality by 1 percent would decrease unemployment by 0.26 to 5.27 percent, depending on the wage-setting process in the formal sector. This result is important, especially given the finding by [La Porta and Shleifer \(2014\)](#) that employment growth rates are much lower for informal than formal firms (5 versus 10 percent per year).

Relatedly, [Anand and Khera \(2016\)](#) develop a dynamic stochastic general equilibrium (DSGE) model with informality, in which PMR are modeled as sunk entry costs for firms. They calibrate the model to match the Indian economy. Product market deregulation increases output and lowers informality in the long run, and thereby increases wages in both sectors, especially the formal one. These long-run gains are accompanied by short-run adjustment costs due to the slow reallocation of resources between the formal and informal sectors, which can last up to 5 quarters after the reform. New (formal) firms can be hobbled, not only by entry regulations that reduce the number of them established, but also by the requirement of special permits or licenses that restrict certain professions and economic actions. On one hand, this sort of licensing acts similarly to classical entry barriers by reducing competition, increasing prices, and lowering employment in the sector. On the other, anti-competitive regulations in upstream sectors condition the rollout of other activities in other sectors. Consequently, licensing of professional services or restrictions of network sectors can have large spillover effects on other sectors of the economy ([Arnold et al., 2011](#)) (see also discussion in Section 3.3.1).

In India, [Aghion et al. \(2008\)](#) consider the “License Raj,” a nationwide system regulating entry and production activity, which was exposed to successive liberalizing reforms. Delicensing manufacturing sector led to a statistically significant increase of around 6 percent in the number of factories within an industry, albeit no significant increase in real output. Interestingly, the authors find stronger positive effects on the number of firms and productivity when pro-employer regulations are stronger. In a working paper, [Rizzica et al. \(2020\)](#) analyze how in Italy, different zones were successively (and sometimes arbitrarily) designated as having touristic value and then given the right to operate for longer hours. This type of special license had large but heterogeneous employment effects in firms. While, on average, employment increased by 3 percent in zones that were given the possibility of opening their shops for 24 hours daily, this effect was driven by larger establishments that could react more flexibly to the new possibility.

3.2.3 Liberalizing Markets to Trade and Foreign Participation

In many countries, there are heavy restrictions regarding whether and how foreigners can trade with, invest, or operate in (specific sectors of) the economy. These regulations may range from mild restrictions on foreign direct investment (FDI) to outright prohibitions on foreign firms to operate. Such policies not only impact labor market outcomes through the level of competition on product markets but also hold direct implications for wages due to international spillovers. By altering the speed of new technology adoption and the availability of intermediate products, they can also affect labor productivity ([Melitz and Redding, 2014](#)). Finally, a tight connection to international markets can affect job quality and security through improvements in management practices and insurance against production or credit shocks.

One should note that there is some well-founded skepticism around whether openness to trade is beneficial to domestic labor market outcomes. For example, there is a set of prominent studies around the topic of trade-induced employment losses in the context of US-Chinese trade relations. [Autor et al. \(2013\)](#) document large negative effects of increased competition with China on

employment, labor force participation, and wages in local labor markets in the United States. [Acemoglu et al. \(2016\)](#) also estimate large negative employment effects, exacerbated through input-output linkages between various US industries. [Pierce and Schott \(2016\)](#) also confirm these large negative employment effects. The fact that these studies all rely on different identification and estimation strategies increases confidence in their findings. However, it is important to note that the manner in which the gains of trade materialize is highly dependent on the structure of economies regarding their resources and production technologies. While labor is an expensive factor in production in the United States, its cost is very heterogeneous across countries. Therefore, this type of adverse employment substitution effects must not be expected from enacting lower trade barriers in other country settings.

Despite the negative employment effects documented upon trade liberalization for the US, opening domestic markets to trade and foreign investments is often considered a sensible option to improve countries' level of competitiveness. This is particularly true for LMICs, which tend to be most restrictive in these dimensions than higher-income countries. Country research by the [OECD \(2018a\)](#) documents skewed entry conditions for domestic versus foreign firms in Kazakhstan: while domestic firms enjoy highly facilitated registration processes, foreign firms and suppliers are hindered by burdensome procedures, low automation, and poor information availability. Besides entry requirements, there are sometimes differences in operational rules. In Indonesia, foreign companies are required to hold higher minimum capital requirements, to comply with stringent conditions on the employment of foreigners in key management positions, and to be subject to limitations on branching and land access ([Lewis et al., 2022](#)). In addition, some activities are entirely reserved for domestic companies. In a recent report, [Vitale et al. \(2020\)](#) rely on the 2018 edition of OECD PMR indicators on 35 OECD and 11 non-OECD countries to illustrate the potential of liberalizing countries' trade and FDI regulations. The authors point out that, compared to the OECD average, countries in Latin America and the Caribbean rank especially restrictive in these dimensions and could profit from opening up more to foreign trade and participation. More generally, they also highlight the particular importance of lowering domestic entry barriers for foreign suppliers, especially concerning the retail trade and professional services.

To what extent can increased openness to trade and FDI positively affect labor market outcomes? A strand of empirical work documents how countries see higher aggregate employment when they increase competition in product markets by widening scope for trade and/or foreign participation. Using panel data from 20 OECD countries, [Felbermayr et al. \(2011\)](#) find that a 10-percentage-point increase in trade openness lowers the equilibrium rate of unemployment by about 0.8 percentage points. Most importantly, however, they find no evidence for an unemployment-increasing effect of trade openness in their panel data set or in a larger cross-sectional one. Similarly, [Piton and Rycx \(2019\)](#) rely on OECD PMR indicators and country-fixed effect regressions to analyze the effects of product market deregulations on employment. Alongside to lowering entry barriers, they find that reducing barriers to trade and FDI is key to explaining the overall impact of product market reforms between 1998–2013. The average trade and FDI reforms over the period are associated with a decline in the predicted unemployment rate by 0.3 percentage points.

Facilitating the entry of foreign firms has potentially large implications for consumer welfare and labor market dynamics. [Atkin et al. \(2018\)](#) analyze the effects of a period of accelerated foreign supermarket entry in Mexico. Using highly detailed microdata, such as bar code-level prices and consumption quantities, store-level profits, and worker-level incomes, they are able to disentangle the various channels through which foreign entry affected household welfare in the municipalities of entry. Relying on a flexible model, the authors estimate important welfare gains for the average household of 6 percent of initial household income. While there were no effects on average municipality-level household incomes or employment, there were substantial reductions in markups and marginal costs of local firms, suggesting spillovers from foreign entry (for example, better management practices or improved logistics). Lower prices and increased product varieties benefited all households, although richer households benefit more as their elasticity of substitution across different stores is higher: the richest households substitute over 50 percent of their retail consumption to higher-quality foreign stores, while the poorest substitute less than 15 percent.

In a recent working paper, [Farrokhi and Pellegrina \(2022\)](#) rely on data at the 10km² level from the Food and Agriculture Organization (FAO) to calibrate a structural model that emphasizes the links between trade, crop specialization, technology choices, and agricultural productivity worldwide. Through counterfactual exercises, the authors show that reductions in trade costs from 1980 to 2007 increased food consumption by 4 percent and welfare by 2.5 percent. The drivers of these improvements are, with roughly equal importance, gains through technology adoption and crop specialization across countries, given their natural preconditions for different crops. The paper provides important evidence on the gains of reducing trade barriers, especially for economies that still rely largely on agriculture.

Besides these aggregate results, some research examines how trade openness and FDI affects labor market outcomes at the firm level. Using firm-level data, [Bloom et al. \(2016\)](#) exploit the increased import competition in 12 European countries following China's entry into the World Trade Organization (WTO) in 2001 to examine the impact on local firms. Relying on instrumental variable designs, they find that import competition led to increased innovation, R&D investment, and higher management quality within surviving firms. At the same time, it reduced employment and survival probabilities in low-tech firms and triggered a reallocation of labor toward more technologically advanced firms.

In LMICs, [Brambilla et al. \(2017\)](#) document the prevalence of wage premia when working for exporting firms. The average premium of working for an exporting firm in their sample of 61 low- and middle-income countries is 25 percent. When controlling for the foreign versus domestic ownership status, this decreases by up to 17 percent. They identify four major drivers of the wage premia: compared to non-exporting firms, exporting ones hire more skilled workers, utilize more sophisticated machines, buy higher quality inputs, and are more productive.

Entry of large multinational firms in LMICs has, in a few historical cases, translated to these firms exerting monopsony power and dominating local labor markets. [Mendez and Van Patten \(2022\)](#) study the case of the monopsonistic power of the United Fruit Company (UFC) in Costa Rica between 1899 and 1984. Contrary to the assumption that foreign multinationals can hurt workers,

they find the firm had a positive and persistent effect on living standards. Aiming to attract and maintain a sizable workforce, the UFC invested heavily in local amenities, including education and health infrastructure.

3.2.4 Distortionary Governmental Policies and Practices

Governmental policies and practices can have a substantial negative influence on the contestability of markets when they act in a distortionary manner. This is the case, for example, when state-owned enterprises (SOEs) enjoy special privileges or political connections that matter for the operation of private firms, or when distortionary subsidies and price controls are in place.

Examining the current regulatory state, [Vitale et al. \(2020\)](#) show that public firm ownership is still quite widespread among most OECD and non-OECD countries—both in terms of the number of sectors in which governments control at least one firm and of the number of shares they own in the largest firms in key network sectors. In Indonesia, the OECD indicator of “Distortions Induced by State Involvement” is comparatively high ([Lewis et al., 2022](#)) with SOEs being widely present across the economy in 35 out of 41 covered economic sectors. These Indonesian SOEs have access to finance at privileged conditions compared to private firms and sometimes even benefit from government guarantees. This creates an uneven playing field between private and public enterprises. In addition, there are legal inequalities: the Indonesian constitution protects the state’s role in business activities that are deemed to be important for the public and the competition law allows SOEs to operate legal monopolies in certain economic activities. All of these factors threaten the contestability of markets.

In Kazakhstan, the [OECD \(2018a\)](#) explains that SOEs are often not covered by the same laws as private firms and could benefit from favorable treatment compared to the private sector. It further seems that the ownership and regulation of SOEs are not yet in separate public bodies and that the government directly assigns the leadership of these enterprises instead of having elections run through a designated board. In the Middle East and North Africa, SOEs also still enjoy many privileges. For example, in Egypt and Kuwait, the national air carriers are under governmental control and benefit from preferential treatment regarding airport time slots and kerosene prices ([Islam et al., 2022](#)).

As states get more involved in a sector, the risk of discretionary policies there rises. [Argent and Begazo \(2015\)](#) conducted a case study on Kenya’s maize and sugar markets. When the paper was written, government-controlled sugar factories had held a 37-percent production share over the previous decade, not counting other companies of which the government held additional non-controlling shares. As the state occasionally imposed price controls for sugar, it directly influenced the competitive conditions faced by its own establishments. In the flour market, price controls were also common. The paper reports that the 1993 removal of subsidies for a specific type of flour allowed the prices of all flour types to drop substantially within 2 years. This greatly benefited workers in their role as consumers. However, by 2015, the Kenyan government still intervened in the grain market through anticompetitive policies, with estimates suggesting that this increased prices by an average of 20 percent. Relaxing government policies that restrict competition in the maize market could reduce poverty by 1.8 percent and increase real incomes by about 1.2

percent, according to estimates.

While it is clear that distortionary governmental practices and policies hamper contestability of markets, there is very limited evidence on their direct effects on labor market outcomes. [Piton and Rycx \(2019\)](#) associate a decrease in state control with higher unemployment in their sample of OECD countries. In Brazil, [Arnold \(2022\)](#) finds that the privatization of state-owned enterprises in the 1990s reduced wages by 25 percent among workers who remained in the privatized companies. Private sector firms connected to the privatized enterprises also lowered wages, and formal wages decreased by 3 percent overall. However, given the lack of evidence on the employment margin, the total welfare consequences of privatization remain unclear in this case. From these two papers it seems that the role of state interventions is highly dependent on their political and socioeconomic context.

3.2.5 Antitrust Law and its Enforcement

Finally, effective antitrust regulations are crucial for promoting competitive markets. Careful merger controls, rules against abuse of market dominance, and anti-competitive cartel agreements are crucial to avoiding artificially high prices and promoting allocative efficiency. The OECD recommends some measures to achieve this. For example, regulating the interaction of legislators and policy makers with interest groups is considered essential to enhancing transparency and accountability in antitrust issues ([Vitale et al., 2020](#)). Furthermore, the OECD suggests that there should be a competition commission, which acts as an independent body and has a direct mandate to advocate product market competition ([Lewis et al., 2022](#)).

There is relatively little economic research emphasizing how antitrust law and its enforcement affect labor market outcomes immediately. We refer to some work below, but not that there is a need for future research in this important field. Some research has investigated the implications of employer concentration on wages and employment. Such concentration can possibly occur in settings in which no effective merger control is given. [Posner \(2021\)](#) argues that monopsonized labor markets favor wage suppression by firms that know of the frictions that workers face in switching to a different labor market. Similarly, monopsonies are also associated with higher consumer prices and slower growth, which is again harmful to workers. The author thus calls on antitrust institutions to take the labor market implications of antitrust more into account when designing and enforcing the associated laws.

[Schubert et al. \(2022\)](#) rely on detailed geographical information from workers' curricula and develop a new instrument to identify the causal effects of employer concentration. They find such concentration to reduce wages substantially, especially if occupational outward mobility of workers is low: moving from the median to the 95th percentile of employer concentration reduces wages by 2.6 percent on average and by 7.3 percent for workers in the lowest quartile of outward occupational mobility. However, the authors conclude that the aggregate importance of this effect on wages in the United States is minor, as only 10 percent of the population lives in areas with substantial levels of employer concentration. The extent to which the concerns related to employer concentration matter in LMIC settings remains an open question. While employer concentration is likely lower in these

countries, workers' occupational mobility may also be lower, given limited geographic mobility and high-risk aversion caused by more stringent financial constraints.

Finally, [Berger et al. \(2023\)](#) study the impact of different regulatory approaches toward mergers. They simulate how two different antitrust guidelines in the US (stringent 1982 merger guidelines and more lenient 2010 ones) affect local labor markets. They find that workers are, on average, harmed under the enforcement of more lenient guidelines, even after accounting for the efficiency gains from the merger.

3.2.6 Synthesis of PMR Promoting Contestable Markets

It is a well-established fact that achieving higher levels of competition in product markets helps increase aggregate productivity and improve the welfare of consumers. By ensuring that all resources are used where they are most productive, greater competition enhances the allocative efficiency of markets. This directly leads to a higher aggregate productive capacity. In addition, the constant challenge of new firms entering the market effectively incentivizes incumbents to adopt better production technologies and management practices, or leave the market, making way for other more productive competitors. This leads to accelerated aggregate technological progress. Both of these developments will, over time, lead to more and cheaper production, translating into increased levels of consumption for the country's population, i.e., increases in GDP and consumer welfare.

In addition, there is evidence that contestable markets promote economies' dynamism and make them more resilient to business cycle conditions and recessions ([OECD, 2018b](#)). Likewise, firms can cope better with adverse conditions when their operational and management structures are more flexible: they can take appropriate countermeasures faster and adjust them given the individual conditions in the firm. Overall, this increased economic resilience again translates into direct benefits for consumers and investors.

The literature reviewed in this section adds to this evidence by showing that the functioning of product markets also has direct implications on labor market outcomes, such as employment rates, wages, and job quality. In both in the empirical and theoretical literature, these aggregate economic outcomes are consistently associated with higher employment levels in the long run. There is considerably less empirical evidence on the effects of product market deregulation on wages. However, most of the papers that emphasize this dimension conclude that there is (at least) an increase in real wage levels, i.e., an increase in wages after taking the purchasing power of consumers into account. In some cases, the literature even explicitly finds increased nominal wages.

While more evidence from LMICs would be desirable, findings from high-income countries consistently show that deregulatory product market reforms can entail short-term costs. These occur in the form of increased unemployment and lower consumption in the short run. Also, as reforms initiate a transition toward a new equilibrium, some incumbent firms may cease operation. This necessarily hurts the associated entrepreneurs and employees and may help explain some of the political resistance against product market deregulation. Thus, for a successful policy implementation, it may be helpful to develop a better understanding of which types of workers and

firms are most affected by a reform, and design appropriate compensation measures.

In addition to the effects mentioned above, product market structures hold direct implications for workers by affecting job quality. On one hand, direct rules on production processes, such as those ensuring production safety, can be beneficial to workers' health. On the other hand, jobs can become more fulfilling when product markets reward firms that have more sustainable business models, financing options, and management structures. From an aggregate perspective, the increased resilience of firms against recessions and business cycles could also benefit the labor force as unemployment spells become shorter. Finally, there is some research from middle-income countries showing product market structures can affect job quality by lowering the degree of informality in the market (without reducing overall employment).

Table 1 provides a high-level summary of the reviewed evidence.

3.3 Liberalizing Firm Operation

So far, we have discussed various PMR that affect employment and other labor market outcomes by affecting the degree of competition in product markets. This section emphasizes a different channel, by reviewing policies and regulations that condition firms' operations, such as the availability of intermediate inputs, taxation schemes, and firm ownership structures. These can, for example, affect decisions about which production technology firms use and whether they decide to formally register with the authorities. To the extent that regulations affecting firm operations apply equally to all firms and consistently over time, they do not necessarily alter the contestability of markets. Furthermore, they are usually not put in place with the intention of fostering or limiting competition on product markets.⁴ That said, *how* firms are run can have important implications for workers regardless of the level of product market competition. Regulations affecting firm operation can, for example, alter the labor demand workers face, the type of required skills, or the quality of available jobs.

The policies and regulations discussed in this section are structured into three themes. Subsection 3.3.1 reviews PMR that affect firm operations by altering the availability of intermediate inputs. More specifically, it focuses on regulations affecting the professional service and network sectors, which are generally thought of as crucial prerequisites for the smooth functioning of upstream production. In a way, this subsection relates to the previously assessed literature on pro- and anti-competitive regulations in general and confirms their importance for within-sector labor market outcomes. However, this section adds important evidence on the fact that anti-competitive regulations in intermediate sectors (such as network and professional services) are particularly harmful and due to large negative spillover effects on competition and employment in the entire economy. In Subsection 3.3.3, we review a growing body of research analyzing the effects of distortionary policies, such as size-related firm taxation. These PMR can cause of substantial factor misallocation across firms, industries, or sectors, entailing strong implications for labor market

⁴It should be noted that PMR that condition the operation of firms can still have implications for the level of competition on the market, even if they are applied consistently and equally to all players. This is because such regulations can decrease the flexibility of product markets as a whole and may hamper competition.

Table 1: Impacts of promoting contestable markets on living standards, productivity, and social cohesion

Indicator	Findings	Range of estimates	Details
Living standards			
Consumption	Increases in the long run; mixed evidence in the short run	Reductions in global trade costs over 3 decades (1980–2007) increased food consumption by 4% (Farrokhi and Pellegrina (2022)).	Consumption may ultimately increase due to lower prices, but may decrease in the short run (Cacciatore and Fiori (2016)). Consumption may increase due to trade liberalization (Farrokhi and Pellegrina (2022)).
Employment	Increases	Messina (2006) estimate a reduction of one standard deviation in OECD indicators for entry barriers would result in a 1.6 to 2.3 pp increase in the service employment share for an average income country. Calculations imply that differences in regulations can account for about one-fifth of the cross-country differences in service sector employment shares after controlling for income levels. Nicoletti and Scarpetta (2005) estimate going from the most regulated to the most deregulated PMR OECD country would increase long-run employment rates by 2.5–5 pp. In contrast, Bassanini (2015) finds a decrease in an entry barriers proxy of 1 point (a large change only observed in about 5% of the study sample) decreased service industry employment by 0.6–2.5% in 23 OECD countries.	Multiple studies find employment increases over the short and long run (Bassanini and Duval (2009), Bertrand and Kramarz (2002), Blanchard and Giavazzi (2003), Bordon et al. (2016), Ebell and Haefke (2009), Felbermayr and Prat (2011), Gal and Hijzen (2016), Griffith et al. (2007), Hong (2022), Kaplan et al. (2011), Nicoletti and Scarpetta (2005), Piron and Rycx (2019), Rizzica et al. (2020), Spector (2004)). However, Bassanini (2015) finds lowering firm entry barriers in service sectors might lower short-run employment. These effects depend on the institutional and economic context Vitale et al. (2020). E.g., Bassanini and Duval (2009), Griffith et al. (2007), and Nicoletti and Scarpetta (2005) find PMR deregulation has larger effects on employment when labor market policies and institutions are more worker-friendly.
Employment (particular groups)	Some evidence of heterogeneous employment effects		Piron and Rycx (2019) find highly educated individuals were less positively impacted in terms of employment than low- and middle-educated workers after deregulation. De Serres et al. (2012) find stronger effects for women and youth. Bertrand and Kramarz (2002) find more negative effects of higher entry barriers on female employment shares. Studies find promoting competition can improve real wages in the short and long run (Argent and Begazo (2015), Blanchard and Giavazzi (2003), Ebell and Haefke (2009), Hong (2022)), though some find lower nominal wages in the short and long run (Arnold (2022), Braustetter et al. (2014), Spector (2004)). The effect may depend on the amount of bargaining power workers have Spector (2004).
Labor earnings	Mixed evidence		
Labor earnings (particular groups), labor earnings inequality	Some evidence of lower gender pay differentials. Some evidence of lower income inequality.	Cooke et al. (2019) find a reduction in the gender pay gap by 1.0–1.7pp after a program reduced the time, cost, and bureaucracy of new business registrations in Portugal.	Causa et al. (2015) and Hong (2022) find competition policy/ PMR deregulation reduces income inequality (for general earnings).
Prices	Decrease	Price decreases of 1% after a reform accelerated the business registration process in Mexico Bruhn (2011); and 1.9–6.0% after a program increased the number of supermarkets in the Dominican Republic (Busso and Galiani (2019)).	Increased competition leads to more production and decreased monopsony mark-up power, leading to lower prices (Atkin et al. (2018); Blanchard and Giavazzi (2003), Bruhn (2011), Busso and Galiani (2019)).
Productivity			
Productivity	Increases	Decrease in an entry barriers proxy of 1 point (a large change only observed in about 5% of the study sample) increased labor productivity by 1.7% in 23 OECD countries in Bassanini (2015). FDI liberalization (e.g., one standard deviation increase in foreign presence in services industries) associated with a 7.7% increase in productivity of manufacturing firms relying on services inputs in Czechia. (Arnold et al. (2011)). Other productivity increase estimates are 3% per standard deviation increase in FDI in Chile (Fernandes and Paunov (2012)) and 3.5% following the relaxation of restrictive FDI policies in Indonesia (Duggan et al. (2013)).	Positive effect found by Arnold et al. (2011); Asturias et al. (2017); Bassanini and Duval (2009); Duggan et al. (2013); Fernandes and Paunov (2012); Hong (2022), yet Duval and Furceri (2018) do not find significant effects on productivity. Braustetter et al. (2014) find some evidence of less productive firms emerging after a program reduced the time, cost, and bureaucracy of new business registrations.
Labor reallocation	Increases		Reallocation of labor from less productive to more productive firms (Aw et al. (2001); Meghir et al. (2015)); or towards more technologically advanced firms (Bloom et al. (2016)); or towards the formal sector (Anand and Khera (2016)); or to new entrant firms (Cacciatore and Fiori (2016)).
Output	Increases	Gal and Hijzen (2016) find PMR deregulation in the short and medium term, as measured by changes in several OECD PMR indicators, across 18 advanced economies raised output by 3% after 2 years.	Some incumbent firms may cease operation in the short-run, but Duval and Furceri (2018) find a positive impact of deregulation on GDP; Gal and Hijzen (2016) find PMR deregulation raised output by 3% after 2 years. Anand and Khera (2016) find PMR deregulation increases output in India in the long run.
Social Cohesion			
Social cohesion	Not enough evidence		In our review, we only found one study that loosely measures social cohesion outcomes (Autor et al. (2013) measure, amongst other things, the effects on take-up of welfare services after trade liberalization).

Notes: The category *Labor earnings (particular groups)*, *labor earnings inequality* and effects on specific groups. The category *Prices* includes debt.

outcomes. Finally, in subsection 3.3.2, we deal with PMR affecting firm ownership structures and their effects on workers.

3.3.1 The Special Role of Upstream Sector Regulations

Production linkages across sectors imply that regulations affecting one can have non-trivial implications for others. For example, if a new PMR leads to increased levels of competition in an upstream sector, that can have significant impacts on dependent downstream sectors through reduced prices and an increased supply of intermediate inputs (Duval and Furceri, 2018).

Conversely, a pro-competitive PMR in an downstream sector can trigger spillovers in upstream sectors, for example through increased demand for intermediate inputs of production.

Network and professional service sectors are particularly important upstream sectors, as they provide intermediate inputs that build the foundation for the functioning of most other sectors.⁵ They affect firm's ability to invest in "new business opportunities and better production technology, to exploit economies of scale by concentrating production in fewer locations, to manage inventories efficiently, and to make coordinated decisions with their suppliers and consumers" (Arnold et al., 2016). For example, most companies rely on telecommunications and legal services for the operation of their business. Due to firms' great interconnectedness, policies affecting professional service and network sectors have particularly large multiplier effects on other sectors (Dauda, 2020; Hong, 2022).

A further reason why the focus on professional service and network sectors is essential is that research points to LMICs having much scope for welfare improvement through deregulation in these areas (Vitale et al., 2020). For example, MENA countries often strongly restrict the firm structure of regulated professions such as accountants, lawyers, architects, and engineers (Islam et al., 2022). Lewis et al. (2022) document that in Indonesia, network sectors are particularly prone to state involvement, as most incumbent firms are owned or substantially controlled by the government. In addition, prices in the network sectors are often either directly regulated or subject to government pricing guidelines. Similarly, in Kazakhstan, retail price controls and regulations are particularly high in the network sector (OECD, 2018a). For example, the government regulates or approves the retail tariffs in air transportation, electricity, and gas sectors, and influences prices for gasoline and liquefied petroleum gas.

A well-developed literature shows that the deregulation of professional services and network sectors is associated with sizable increases in (total factor) productivity, that goes well beyond these upstream sectors (see, for example, Arnold et al., 2008, 2011, 2016; Bournès et al., 2013; Duggan et al., 2013; Fernandes and Paunov, 2012; Fried and Lagakos, 2020; Van der Marel et al., 2016). There is still relatively little evidence on the labor market effects of such measures. That said, the existing studies mostly suggest that of pro-competitive reforms in the professional services and network sectors are associated with improved labor market outcomes, even beyond the directly targeted sectors themselves. We summarize these studies below.

Barone and Cingano (2011) conduct research using industry-level data from OECD countries. They

⁵In line with the literature, this section will refer to the professional service and network sectors interchangeably as service sectors.

use US input-output tables to proxy each industry's dependency on the network and professional services sector. The authors then rely on these dependencies to create a weighted average score for the regulatory stringency each sector is exposed to through its relevant upstream network and professional services sectors. They then show that service regulation has a significant negative effect on the growth rate of value-added, labor productivity, and exports of downstream industries.

With a focus on labor market outcomes, [Bassanini \(2015\)](#) discusses the short-term effect of lowering entry barriers in three network industries (public utilities, transport, and communications) on industry employment. The author documents a reduction in employment prior to and shortly after the reforms are implemented. He conjectures that this finding hinges on the structure of the downstream sectors considered, which generally consist of large incumbent firms which—compared to small firms as are more predominant in the retail sector, for example—have more scope for protecting their standing in the market by engaging in immediate re-organization and reduction of overstaffing after deregulation. He argues that in sectors dominated by small firms, new entrants following deregulation may even help achieve overall employment growth in the short run.

[Gal and Hijzen \(2016\)](#) use cross-country firm-level data from the Amadeus/Orbis database to examine the effects of product market deregulation in three sectors (network industries, retail trade, and professional services). Using local projection techniques, they find positive effects of product market reforms on capital, output, and employment in the respective sector of the reform. To identify downstream spillovers, they construct indirect measures that weigh reforms in upstream industries in a way that reflects their importance for downstream production. In addition to using national industry-level input-output tables, the authors also consider cross-country linkages and firm-level information about the general reliance on intermediate inputs in production. They find positive spillovers on firms in downstream industries both domestically and abroad. Furthermore, their results suggest that the impact of upstream reforms is more positive for downstream sectors that exhibit a high level of competition ex-ante. Compared to services, manufacturing firms showed greater increases in employment, value-added, and output after the reform. Intuitively, more competition is associated with a higher output elasticity with respect to prices, such that a reduction in prices of intermediate inputs will lead to larger effects on output and employment.

Focusing on 26 advanced economies, [Duval and Furceri \(2018\)](#) rely on a narrative database of major reform shocks in a wide range of product and labor market areas. On the product market side, the reforms take place in any of the following sectors: telecommunications; postal services; electricity; gas; and air, rail, and road transport. In one section of the paper, the authors examine the impacts of deregulation on a sectoral level to understand the indirect effects that deregulation of a sector can have on upstream sectors (through forward spillover via reduced prices and increased quantities) and downstream sectors (through increased demand for intermediate inputs following deregulation). They find a statistically significant impact on output in both downstream and upstream industries of about 0.3 percent on average 4 years after the reform. This is mainly driven by increased labor productivity (as opposed to increased employment levels).

3.3.2 Regulations Affecting Firm Ownership Structures

Policies or institutional settings that condition the ownership structure of firms can have implications on labor market outcomes by altering the rent-seeking conflict between employees and shareholders, distorting incentives of firm owners, or affecting management efficiency. The policies most relevant for increasing within-firm production efficiency vary greatly country by country. In all cases, however, it is key to achieve high management efficiencies—either through the appropriate selection of managers or the right incentive structure.

There is abundant evidence about how good management benefits firm performance and employees. [Bender et al. \(2018\)](#) use highly detailed employer-employee data from Germany to show that plants with higher management scores are more productive. This relationship holds true even after accounting for the fact that high-productivity firms also feature higher average worker skills and are strongly driven by the human capital of the (top) managers. Estimates suggest that a one standard deviation increase in the management score is associated with a 15–21-percent increase in labor productivity. Such well-managed firms are also able to pay their employees higher wages relative to what the market as a whole could offer these workers. The evidence from this and related papers justify a deeper investigation into how more efficient and skilled management teams can be achieved.

While such high-quality data do not exist for most LMICs, the main message about good management improving labor productivity also holds in their context. For example, [Bloom et al. \(2013\)](#) find a large causal role of management practices for productivity in Indian textile plants by implementing a randomized controlled trial. Reviewing the evidence for a larger set of LMICs, [La Porta and Shleifer \(2014\)](#) note that unproductive, informal establishments are predominantly run by poorly educated entrepreneurs. To the extent that education improves managerial skills, this is further evidence of the importance of good practices for efficient production and favorable work conditions.

As noted earlier, the type of PMR that are most crucial for aggregate labor market outcomes depends fundamentally on their political and economic context. While land, capital, and intellectual property rights are crucial to efficient firm operation globally, their weak enforcement in LMICs sometimes still impedes delegating tasks beyond kinship ties. [Adamopoulos and Restuccia \(2020\)](#) examine a 1988 land reform in the Philippines, which introduced limits to farm sizes, redistributed land to landless or smallholder families, and imposed barriers to trading property rights on the market. Not only was this reform another example of a size-dependent policy in the fashion of those discussed in Subsection 3.3.3, but it also had direct implications for the management of farms. To quantify the effects of the reform on production efficiency, the authors develop a structural model with endogenous occupational decisions and technology choices. They use farm-level microdata from before and after the reform to discipline the model, and estimate that the reform reduced average farm size and agricultural productivity by 34 percent and 17 percent, respectively. Around one-third of this decline in productivity can be explained by the assignment of land to untalented farmers.

Besides hindering the allocation of talent, policies on ownership structures can distort the incentives of managers. In India, [Banerjee and Iyer \(2005\)](#) rely on historical differences in property rights

during the British colonial rule and compare land that was indirectly controlled by landlords versus directly by cultivators. They find that agricultural yields are 16 percent higher in historically cultivator-controlled areas and argue that the differences in productivity are due largely to differences in investments. Landlords controlling the cultivators working on the plots have higher rent-seeking motives and fewer incentives to invest in better production technologies in the short run. There are two key takeaways from this seminal paper. Firstly, ownership rights are decisive for economic outcomes because they govern the incentive structures of stakeholders. Secondly, institutions regulating ownership rights are of foremost importance, as they can propagate economic outcomes even several decades after their abolition.

In countries with developed financial markets, outside investors are often considered beneficial for firms' governance: the monitoring incentives of investors are thought of as beneficial to management efficiency by pointing out problems early and having the power to pressure the current leadership to implement much-needed change. It is, however, less clear what implications different ownership structures have for employees. A working paper by [Falato et al. \(2022\)](#) empirically reviews the relationship between shareholder power and employment in the United States. It argues that high rates of institutional ownership hurt employment in firms. In the data, a growing concentration among institutional shareholders is associated with lower employment and wages within establishments, with a much stronger effect when the institutional investors have strong control motives, as is the case for activist hedge funds, for example. In the authors' preferred differences-in-difference specification, a 10-percentage point increase in large shareholder ownership is associated with a 2.1 to 2.5 percent reduction in the establishment's employment and payroll. Interestingly, the authors also find evidence for losses in labor productivity, which do not seem to vanish even within the following 2–3 years. Overall, the evidence indicates that shareholder power has mostly reallocating effects, shifting value away from workers and toward shareholders.

3.3.3 Distortionary Product Market Regulations

Since the seminal contribution of [Restuccia and Rogerson \(2008\)](#), it is an established fact that the misallocation of resources across firms can have important effects on the aggregate productivity and welfare of an economy. [Hsieh and Klenow \(2009\)](#) make this argument through a specific example: they show that when the degree of distortions, which are the root for factor misallocation, across manufacturing firms in China and India were reduced to United States levels, total factor productivity increased by 30–50 percent and 40–60 percent, respectively. [Bento and Restuccia \(2017\)](#) note that the nature of factor misallocation in LMICs implies an important role for “correlated distortions.” This term from [Restuccia and Rogerson \(2008\)](#) captures the notion that firm characteristics are correlated with the degree of implicit or explicit taxes they face. If particularly productive or innovative firms are taxed more than their less-promising counterparts, that entails non-negligible implications for overall economic outcomes. The following example, borrowed from [Hsieh and Klenow \(2009\)](#), should give the reader a good understanding of the mechanism at play:

“For example, imagine an economy with two firms that have identical technologies but in which the

firm with political connections benefits from subsidized credit (say from a state-owned bank) and the other firm (without political connections) can only borrow at high interest rates from informal financial markets. Assuming that both firms equate the marginal product of capital with the interest rate, the marginal product of capital of the firm with access to subsidized credit will be lower than the marginal product of the firm that only has access to informal financial markets. This is a clear case of capital misallocation: aggregate output would be higher if capital was reallocated from the firm with a low marginal product to the firm with a high marginal product.” (Hsieh and Klenow, 2009, p. 2)

In more recent work, [Restuccia and Rogerson \(2017\)](#) review the collected evidence on the causes and costs of factor misallocation across firms. The latter is by far more important in developing than advanced economies and can explain an important fraction of cross-country TFP differences. The authors mention potential drivers of factor misallocation, including size- and place-dependent policies, preferential treatment of SOE, property rights enforcement, certain trade and competition policies, and financial and informational frictions. [David and Venkateswaran \(2019\)](#) develop a model that offers more detailed insights into the drivers of misallocation across countries measured by the total cross-sectional dispersion in marginal revenue products. In particular, they distinguish between capital adjustment costs, informational frictions, and other policy distortions as causes of misallocation. Both in the United States and China, firm-specific policy distortions account for the bulk of this variation. For China, certain types of financial frictions or policy-related distortions (for example, size-dependent rules) seem to be important drivers of misallocation, while these explain much less variation in mark-ups in the US.

With the above-mentioned papers in mind, the argument about the importance of factor misallocation as a driver for aggregate economic outcomes is clearly not new. Nevertheless, there are only few economic papers linking specific PMR to misallocation. A possible reason for this is the difficulty in measuring wedges in labor or capital costs in the data and attributing them to specific regulations. The rest of this section reviews some of the literature that deals with policies that can cause or amend factor misallocation and thereby alter firm productivity and the welfare of workers.

Most countries implement policies that aim to promote or protect specific sectors of an economy. Examples of these directed product market policies are direct investment subsidies for certain types of firms, different taxation based on firms' ownership structures, or policies that aim to foster innovation by subsidizing start-ups or small businesses. While these policies may be effective in achieving the goal that they were designed for, they hold the risk of introducing additional distortions, which may harm employment growth or decrease wages. Size-dependent policies, i.e., ones that apply only to businesses exceeding a certain market capitalization, number of employees, or turnover value, can easily become so-called correlated distortions in the spirit of [Restuccia and Rogerson \(2008\)](#) and [Hsieh and Klenow \(2009\)](#).

Size- or technology-dependent policies hold a particular danger in countries where informality is widespread, as they encourage firms to “stay under the radar” to avoid taxation or additional operational costs related to reporting and accounting. By encouraging informality, such policies hurt job quality from the worker's perspective, as they remain excluded from the benefits associated with social security systems or national laws such as minimum wage requirements or annual leave.

One paper that takes up this argument is [Lagakos \(2016\)](#), which examines cross-country differences in retail trade productivity driven by the technology used by firms. In his model, firms choose their production technology endogenously upon consideration of two factors. Firstly, modern technology use is taxed more heavily than traditional technology. This is not necessarily meant to capture a legal reality but to reflect the fact that firms are tempted to stay informal to avoid taxes and that this is easier when remaining under the radar and not employing state-of-the-art technologies. Secondly, the paper imposes complementarities between household technologies and modern versus traditional retail goods. Modern goods are more easily consumed when households are already in possession of advanced technologies (in the calibration, this is proxied by car ownership). Model calibration suggests that cross-country differences in the relative use of the modern technology is explained to roughly the degree of two-thirds by the prevailing car ownership rates and roughly one-third by the misplaced incentive to evade taxes by using traditional technology. To the extent that the informal status of firms can be considered as harmful to job quality, this has wide-reaching effects on workers.

In the context of advanced economies, [Rodrik and Stantcheva \(2021\)](#) criticize prevailing skewed finance conditions for different types of R&D activities and technologies, which often discourage investments in labor-friendly technology. [Lerner and Nanda \(2020\)](#) review the dangers of large investments in technology financed by venture capitalists. They note that recent developments in the sector—prominently the centralization of the private equity market—introduce new risks into this much-praised form of financing. They argue that venture capital investors are disproportionately drawn to sectors with large uncertainty about an idea’s potential, which can then be resolved quickly. This creates disadvantages for other types of innovations that are potentially more productivity-enhancing but less uncertain or designed for longer-term investments.

The evidence reviewed so far examines distortions that are correlated with firms’ size, production technologies, or political connectedness. The primary outcome variable in these studies is (aggregate) productivity, which influences workers only indirectly. [Rodrik and Stantcheva \(2021\)](#) go a step further and develop policy recommendations that aim to directly promote more and better jobs by addressing existing distortions. Mostly focusing on advanced economies, they propose amending the relatively strong taxation of labor income compared to capital income taxation, which makes it more attractive to firms to economize on labor by investing in machinery. They also discuss how explicit government-funded and -directed innovation programs could be used to incentivize technologies that are labor-friendly in the sense that they require retaining human workers.

From the perspective of increasing employment, a particularly successful government intervention was the Regional Selective Assistance (RSA) program in the UK targeted at manufacturing firms in disadvantaged geographic areas ([Criscuolo et al., 2019](#)). The program was originally designed to “create and safeguard employment” in manufacturing and allowed firms to apply with specific investment plans, either to finance new capital equipment or to modernize existing plants. If approved, the government financed up to 35 percent of the investment. The authors exploit changes in geographic eligibility criteria to quantify the effects of the RSA program. They conclude that a 10-percentage point increase in a geographic area’s rate of maximum investment subsidy causes

about a 10-percent increase in manufacturing employment and a 4-percent decrease in aggregate unemployment, without simultaneous effects on wages. The program mainly affected the scale of production without causing increases in firms' TFP. Interestingly, the employment effects are driven exclusively by small firms (<50 workers).

Another set of PMR policies that can affect factor allocation are trade and foreign capital investment policies. In India, [Bau and Matray \(2023\)](#) find foreign capital liberalization increased aggregate productivity and reduced capital misallocation for affected industries. Opening up to foreign capital allowed firms not only to invest more, but also to expand their wage bills. Specifically, the deregulation appeared to allow firms with ex-ante high marginal returns to labor to grow faster and expand employment, increasing their total wage bill by 24 percent. These findings indicate how changes in access to capital can also affect the allocation of labor, and workers' earnings, across industries.

3.3.4 Synthesis of PMR Liberalizing Firm Operation

A key takeaway from our analysis of PMR affecting firm operations is that their effects on labor markets are vastly different depending on the specific sector to which they are applied. PMR in upstream sectors, in particular, can have potentially large spillover effects on the broader economy both in terms of production capacity and employment. In addition, we discuss the role of PMR related to the ownership structure of firms. We find consistent evidence that stringent property laws, good management practices, and external control by stakeholders can help establish sustainable firm operations, job stability, and better working conditions.

One should also be aware that regulations may act differently on different firm types. When they affect firms differently depending on their size or ownership structure, regulations hold a particularly high risk of introducing large distortions. Such distortions harm nationwide productivity and, ultimately, overall consumption and welfare. Finally, the preceding section is a reminder that the country-specific context of regulations is extremely important. Especially in countries with low levels of judiciary enforcement capacity, regulations can easily affect a firm's choices to operate formally or informally. This matters greatly for both the evolution of these firms, but also for workers, who in the informal economy forgo any potential benefits from existing social security.

Table 2 provides a high-level summary of the reviewed evidence.

4 Labor Market Regulations

4.1 How Do Labor Market Regulations Affect Workers?

LMR play a crucial role in shaping labor market outcomes and influencing various aspects of workers' lives. Historically, LMR have been justified by the existence of market failures. Imperfect information can, for example, lead to market failures by entailing discrimination toward specific demographic groups and preventing markets from providing insurance against specific risks (such as

Table 2: Impacts of liberalizing firm operation on living standards, productivity, and social cohesion

Indicator	Findings	Range of estimates	Details
Living standards			
Consumption	Some evidence of an increase.	Guner et al. (2008) find a reduction in average firm size by 20% leads to welfare costs (in consumption equivalents) up to 1.5%.	Only found one study (Guner et al. (2008)) that looks at liberalizing firm operation and consumption. They estimate government restrictions on the size of large firms, via taxes, reduce consumption-equivalent welfare costs.
Employment	Increases	Falato et al. (2022): a 10-percentage point increase in large shareholder ownership is associated with a 2.1 to 2.5% reduction in a given establishment's employment and payroll.	Product market deregulation in service sectors can increase employment (Gal and Hijzen (2016)). Ownership structures with concentrated shareholder power can reduce employment (Falato et al. (2022)). However, lowering firm entry barriers in service sectors might lower short-run employment (Bassanini (2015)).
Employment (particular groups)	No evidence found		
Labor earnings	Increases	Liberalization of access to foreign capital across Indian industries (i.e., the automatic approval of foreign investment up to 51% of equity in certain industries) increased wage bills by 24% (Bau and Matray (2023)).	Foreign capital liberalization led firms to expand their wage bills (Bau and Matray (2023)). Ownership structures with concentrated shareholder power can reduce wages (Falato et al. (2022)).
Labor earnings (particular groups), labor earnings inequality	No evidence found		
Prices	Decrease		Increase levels of competition in a sector can lower prices (Duval and Furceri (2018)).
Productivity			
Productivity	Increases	E.g., a one standard deviation in a firm's management score is associated with a 15–21% increase in labor productivity (Bender et al. (2018)). A one-standard deviation increase in a liberalization index increased productivity by 11.7–13.2% (Arnold et al. (2016)).	Reducing distortions that cause misallocation of resources amongst firms can increase TFP (Bento and Restuccia (2017); Hsieh and Kleenow (2009)). Conversely, introducing distortions can lower productivity (Falato et al. (2022)). Foreign capital liberalization may increase aggregate productivity (Bau and Matray (2023)). Policies that improve management practices may increase productivity (Bender et al. (2018); Bloom et al. (2013)). Service sector regulation can negatively affect labor productivity (Barone and Cingano (2011); Van der Marel et al. (2016)); its deregulation can increase productivity (Arnold et al. (2016); Duggan et al. (2013); Duval and Furceri (2018); Fernandes and Paunov (2012); Olley and Pakes (1996)). Studies look at factor (mis)allocation across firms, but no clear measurement of how labor reallocates in response to liberalizing firm operation.
Labor reallocation	Not enough evidence		
Output	Increases	Guner et al. (2008) estimate when a distortionary tax on capital use reduces firm sizes by 20%, average output drops by 25.6% and aggregate output falls by 8.1%.	Product market deregulation in service sectors can increase output (Gal and Hijzen (2016)). Reducing distortions that cause misallocation of resources amongst firms (Bento and Restuccia (2017)) or securing ownership rights (Banerjee and Iyer (2005)) can also increase output. Conversely, introducing distortions can lower output; e.g., increases in concentration in shareholder power (Falato et al. (2022)).
Social cohesion			
Social cohesion	No evidence found.		

Notes: The category *Labor earnings (particular groups)*, *labor earnings inequality* includes both earnings inequality and effects on specific groups. The category *Prices* includes debt.

employment- or health-related risks). The existence of monopsony (or labor market) power, which arises in labor markets where only a few employers demand labor, can also be considered a market failure.⁶ This is closely tied to the issue of low competition in product markets (see Section 3.2), and can have detrimental implications for workers' labor market outcomes (working conditions, wages, etc.).

While LMR may be warranted to combat market failures, there is a trade-off between regulation and economic dynamism. For this reason, policy makers have good reason to avoid over-regulation as it hinders economic efficiency (OECD, 2018), by undermining the reallocation of economic activity across sectors and firms. This argument is also a typical reason why producers tend to oppose regulations that impose constraints on how they can employ workers, who represent an essential factor of production. The Great Recession led to increased public support for increasing the flexibility of labor markets and thereby contributing to a more crisis-resilient economy. Such measures included making existing LMR more flexible or abolishing some of them entirely (Blanchard et al., 2014). The COVID-19 pandemic added nuances to the discussions of how much flexibility is necessary in times of crisis.

With both rationales for the existence of LMR and cautionary tales of its overuse in mind, we review the evidence available in the recent literature.⁷ Specifically, Section 4.2 highlights the nuanced impact of minimum wage regulations, noting a small short-term unemployment effect and mixed evidence of long-term effects depending on the degrees of labor market power and exposure to international competition. Minimum wages are recognized as a tool for reducing income inequality, particularly contributing to decreased racial income disparities historically. The evidence suggests positive effects on aggregate consumption, durable goods purchases, and even productivity, with uncertain impacts on social cohesion. Section 4.3 reviews employment protection legislation, emphasizing the negative impact on wages, mixed effects on unemployment, and varying influences on productivity. Flexibilization through temporary contracts is acknowledged as a potential means to boost productivity but requires careful implementation to avoid the emergence of dual labor markets with job instability for certain workers. Furthermore, union presence is associated with higher wages and lower wage inequality, with outcomes dependent on bargaining levels (Section 4.4), while mandated benefits such as unemployment insurance and pension schemes show mixed effects on employment, wages, and productivity (Section 4.5). Finally, paid family leave is noted to have contested long-run employment effects but a positive impact on productivity through lower turnover and increased labor productivity.

In broad terms, the evidence on the effects of LMR is qualitatively equivalent between high and low income countries. This is despite the fact that the share of non-covered workers in developing countries is much higher (as the size of the informal sector is larger) and the levels of noncompliance within the formal sector are greater. The quality of the evidence available is lower though: developing countries count on much less rigorous evidence given the lack of readily accessible high-quality microdata (with the exception of Brazil). Instead, most of the information comes from

⁶See Manning (2021b) for a discussion of the available evidence in favor of the existence of monopsony power in the labor market.

⁷The evidence before 2012 is discussed in more detail in Betcherman (2012b).

aggregate employment and wage statistics and/or small-sample surveys which might not be representative of all realities of a country, making the use of state-of-the-art methodological techniques impossible. For this reason, for developing countries, there is a greater share of evidence exploiting cross-country variation (see [Belman and Wolfson, 2016](#), for a more in-depth methodological review of minimum wage studies in developing countries). Across the world, Sub-Saharan Africa is the region with the least evidence of the economic effects of minimum wage. [Bhorat et al. \(2017\)](#) argues in favor of the release of country-level earnings and employment data at regular intervals for a more substantive country-focused minimum wage research agenda.

4.2 Minimum Wage

Most countries in the world have a minimum wage: statutory or negotiated minimum wages exist in 90% of the 187 ILO member countries.⁸ But there are important differences across countries when it comes to setting it. Minimum wages can be set at the national and/ or the sub-national level (i.e., region, city or firm level); there can be different minimum wages for different workers (for example, teenagers and trainees are subject to lower minimum wage levels in some countries); and it is common that some sectors are excluded *de jure* (as in the case of domestic workers, self-employed and unpaid family members) or *de facto* (like informal workers).

While in high-income countries having several minimum wages could help avoid adverse economic effects (decreased employment, price rises, etc.), especially when there is heterogeneity across regions and across workers in skills and experience ([Ahlfeldt et al., 2022](#))⁹; in low-income countries more complex minimum wage systems, with differences at the subnational level, have been associated with lower levels of compliance than national regulations ([Rani et al., 2013](#)). Low compliance is an issue, particularly in developing countries where the size of the informal sector is much greater than in developed countries. Since the degree of compliance determines the extent to which the minimum wage will have an economic impact, the complexity of the minimum wage system is an important aspect for policy makers to consider.

There are also different setting regimes. Minimum wage regulation can be set by the government (i.e., statutory), or negotiated by trade unions and employers' associations. The wage-setting system impacts not only the support for the policy—by definition, collectively bargained minimum wages involve in the discussion a wider share of the society and thus tend to gather more support—but also the level at which the minimum wage is set. When it is set by collective bargaining, it tends to be at a higher level than when it is government-legislated ([Boeri, 2012](#)). This might have implications for the level of compliance both in developing ([Rani et al., 2013](#)) and developed countries ([Judge and Stansbury, 2020](#)), as higher minimum wage levels are associated with lower compliance, even in the case where the minimum wage is the one labor regulation with more resources devoted to its enforcement.

As the degree of compliance determines the extent of the economic impact that minimum wage

⁸See [International Labour Office \(2020\)](#)

⁹[Ahlfeldt et al. \(2022\)](#) argue that an employment-maximizing regional minimum wage would lead to a similar aggregate welfare effect as a welfare-maximizing federal minimum wage while increasing employment by 1.1% instead of reducing it by 5.6%.

regulation will have—and specifically the share of the labor market it will affect—different levels of enforcement might lead to different economic outcomes. In most low-income countries enforcement tightening cannot take place due to the lack of administrative and monitoring capacity governments face. Likewise, the logic that more enforcement would lead to a decline in aggregate employment also plays an important role when deciding the optimal level of enforcement (when that is an option). With tighter enforcement, less productive firms would be the most affected by the minimum wage and this would lead to important negative employment effects. Based on this rationale, [Badaoui and Walsh \(2022\)](#) use information across 22 developing countries with minimum wage regulations¹⁰ to argue that an enforcement regime based on worker complaints can be used to target enforcement toward high-productivity firms and thus avoid the employment cost. The authors show that, while an increase in random enforcement may have large negative employment effects, if a substantial percentage of informal firms could not be viable at the minimum wage, a workers’ complaints-based enforcement would more likely rise compliance and wages in higher-productivity firms but have less impact on lower-productivity ones where workers have little incentive to complain. Contrary to the logic that more enforcement leads to bad employment outcomes [Meghir et al. \(2015\)](#) argue in the context of Brazil that enforcement-tightening does not increase unemployment, but it does increase wages and total welfare by enabling a better allocation of workers to higher-productivity jobs. Recent reviews of the economic impact of minimum wage regulations include [Dube \(2019\)](#),¹¹ [Manning \(2021a\)](#) and [Neumark \(2019\)](#); and focusing exclusively on LMICs: [Broecke et al. \(2017\)](#), [Belman and Wolfson \(2016\)](#) and [Bhorat et al. \(2017\)](#).

4.2.1 Minimum Wage: Impact on Living Standards

The impact of the minimum wage on wages and labor earnings: Starting with the evidence gathered for developed countries on wages: by construction (and if binding), the minimum wage raises the wages of employed low-income workers, so long as there is compliance with the regulation. Part of this wage gain arises from a worker reallocation or job upgrading by low-wage workers from smaller to larger, lower- to higher-paying, and from less- to more-productive establishments. [Dustmann et al. \(2022\)](#) find that up to 17% of the wage increase induced by the introduction of the German minimum wage in 2015 is accounted for by worker upgrading. In addition, there is evidence from the United States to suggest that a minimum wage increase also increases the productivity of workers, as long as workers are relatively well-monitored ([Coviello et al., 2022](#)).

Most of the evidence across developing countries also points to higher wages, especially at the lowest end of the wage distribution ([Mansoor and O’Neill, 2021](#); [Campos-Vazquez and Esquivel, 2021](#); [Belman and Wolfson, 2016](#); [Khurana et al., 2023](#)). However, this finding is more nuanced in the developing country context. First, the extent of the effects on wages depends on the level of compliance with minimum wage regulation ([Mansoor and O’Neill, 2021](#)). Second, there is evidence that increases in labor supply following the minimum wage hike might mute the increase in wages.

¹⁰The study includes mostly middle-income countries, but there are a few low-income ones, such as Burkina Faso, the Democratic Republic of Congo, Madagascar, Mauritius, Mozambique, Niger, and Rwanda.

¹¹[Dube and Lindner \(2023\)](#) analyze the impacts of local-level minimum wages.

One study looking at minimum wages on ridesharing apps in Indonesia highlights how effects on earnings might be muted if minimum wages lead to worker oversupply (Nakamura and Siregar, 2022).

There is also plenty of evidence of spillover effects amplifying the earnings effects of minimum wage hikes higher up into the wage distribution (David et al., 2016; Fortin et al., 2021; Cengiz et al., 2022). Firms keeping their relative position in the wage distribution is one commonly used argument of why spillovers arise. However, Forsythe (2022) provides a new data-oriented explanation. She shows spillovers arise within establishments and more specifically toward supervisors, who are likely the workers most aware of relative wage changes. Moreover, increasing supervisors' wages is a way to maintain the career incentives for low-wage workers directly affected by the minimum wage rise. Another explanation of why spillovers arise relates to information frictions: Demir (2023) finds that the public announcement and discussion of a minimum wage in Germany led workers outside of the minimum wage sector to switch jobs and earn higher wages, likely as a result of having new information about their pay in possible outside options. Glasner (2023) also studies spillovers that occur in sectors not covered by minimum wage laws: the self-employment and gig economy space in the United States. He finds an increase in the minimum wage increased workers' participation in these non-covered spaces, particularly in places with active Uber marketplaces.

In LMICs, as in developed ones, there is evidence of minimum wage having wage spillovers on wages higher up in the distribution (Engbom and Moser, 2022). There is also evidence of spillovers on informal sector wages, the so-called *lighthouse effect* (Betcherman, 2012a). Pérez (2020) finds that wage increases follow the minimum wage on both formal and to a lower extent informal wages. Increases are smaller than those implied by full compliance but they are positive for some unaffected workers, providing further evidence of the existence of spillover effects.

Despite spillover effects, the minimum wage reduces inequality in the lower tail of the wage distribution, since this is where wage increases are the most salient (David et al., 2016). Federal minimum wages are also linked with spatial wage convergence, particularly in the left tail of the distribution (Ahlfeldt et al., 2018). Furthermore, evidence on the effects of minimum wage suggests that wage compression increases within affected establishments, with particular compression in the top half of the wage distribution (Forsythe, 2022), following spillover effects toward supervisory wages. There is also evidence the minimum wage reduces the gender wage gap (Caliendo and Wittbrodt, 2022), including among the youngest workers (Majchrowska and Strawiński, 2018).

There is evidence across LMICs that the minimum wage reduces wage inequality (Betcherman, 2012a). Engbom and Moser (2022) find that the increase in the Brazilian minimum wage during between the late 1990s and late 2010s accounts for 45% of the decline in earnings inequality in the country. Haanwinckel (2020) uses a different methodology (i.e. a structural model) to reach the conclusion that the minimum wage is the main contributor to the decline in inequality observed in Brazil over a similar period of study (1998–2012). In line with this evidence, the decline in the Mexican real minimum wage has been found to increase the 10/50 wage percentile difference by 1.4%–1.6% annually (Belman and Wolfson, 2016). However, there are instances where a minimum wage increase might not lead to a reduction in wage inequality. Leckcivilize (2015) finds that given

high-noncompliance rates and weak enforcement, the minimum wage did not reduce aggregate wage inequality in Thailand. Despite evidence that it did compress the wage distribution within large businesses in the covered sector, the effect of the minimum wage did not extend to low and medium firms in the covered sector. There is also evidence the minimum wage reduced the gender wage gap in urban China in the long run, especially among low-wage workers (Li and Ma, 2015).

The impact of the minimum wage on employment: Even though the minimum wage increases the wages of lower-income workers and reduces wage inequality, the aggregate welfare effect of the minimum wage depends also on the effect it has on employment. If, for example, the wages of few rise while the employment of many declines, the aggregate welfare impact will likely be negative, particularly for low-income workers.¹² Recent literature reviews show there is variation across studies when it comes to employment findings, but that the weight of the evidence suggests any job losses are quite small (Dube, 2019; Manning, 2021a), with a median own-wage elasticity across all studies and countries reviewed (US, UK, Germany, Hungary) of -0.16 (Dube, 2019). The quality of the evidence, when considered, reinforces that conclusion. However, a disagreeing view is that of Neumark (2019), who reviews the evidence and argues there are specific methodological and economic reasons—such as the use of close controls or the inclusion of trends for treated and control areas—that help explain the discrepancies in the results from minimum wage studies on employment. Both (in his view, faulted) techniques are associated with finding smaller disemployment effects. The economic reasons that, according to the author, explain the differences in the literature include: the bite of the minimum wage, whether the study focuses on affected workers, the existence of labor-labor substitution, and whether the study uses monopsony models. However, the evidence supporting these arguments is at best mixed (as we will discuss in detail in the next paragraphs), with the exception of accounting for monopsony power, which has been shown to be key when studying the effects minimum wage has on employment.

The most recent studies on the employment effect of the minimum wage (with the most rigorous methodologies and highest-quality administrative datasets) do not find substantive negative employment effects. For Germany, where the minimum wage was introduced in 2015, Dustmann et al. (2022) find no disemployment effect since affected workers reallocate to more productive firms, and Ahlfeldt et al. (2022) find an almost negligible reduction in employment of 0.3% in an equivalent period (2011–2016 of the former; 2011–2018 of the latter). Moreover, Ahlfeldt et al. (2018) find no reduction of employment in the first 2 years following the introduction of the minimum wage even in German low-wage regions. For the United States, Cengiz et al. (2022) find that the number of low-wage jobs remained essentially unchanged over the 5 years following an increase in the minimum wage, pointing toward negligible employment effects not only in the short run but also in the longer run. Similarly, Cengiz et al. (2019) use a differences-in-differences approach to measure the effects of

¹²Hurst et al. (2022) use a putty-clay technology model to study the (long-run) welfare impact of different policies on low-wage individuals in which employment cannot be adjusted immediately after the minimum wage rise. The authors find within the lenses of the model that minimum wage has a small employment effect in the short run, but a larger negative one in the long run and thus adverse welfare consequences. From their estimation, it then follows that introducing an Earned Income Tax Credit (EITC) can be more welfare-enhancing than a minimum wage hike. However, the authors also show that the most optimal policy to increase the welfare of low-wage individuals in the long run is a combination of a small minimum wage increase and an EITC. Likewise, more tax progressivity could lead to similar results.

minimum wages on log-wage jobs in the US and find the overall number of low-wage jobs remained essentially unchanged. In line with this evidence, [Harasztosi and Lindner \(2019\)](#) look at Hungary over the early 2000s when the minimum wage increased from 35% to 55% of the median wage—a permanent shift in the level—and find only small negative employment elasticities even 4 years after the minimum wage hike. There is also historical evidence from [Derenoncourt and Montialoux \(2021\)](#) that the 1966 Fair Labor Standards Act—which extended the federal minimum wage coverage to agriculture, restaurants, nursing homes, and other services previously uncovered—did not have any disemployment effect on Black workers (who were the most benefited by the policy in terms of wage increases) during the civil rights era (1960s–1970s).

Overall, it does not seem that a specific focus on small minimum wage increases can explain the lack of negative employment effects. Furthermore, [Cengiz et al. \(2022\)](#) find no evidence of disemployment effects even when they consider higher levels of minimum wages. Likewise, [Dube \(2019\)](#) argues that evidence based on the effects of high minimum wage levels shows that the effects are not substantially different than those found in less-ambitious cases. In addition, economic projections of a US federal minimum wage at \$10, \$12, or \$15 per hour, show non-negligible employment effects only for the \$15 minimum wage, which would more than double the 2024 federal minimum wage of \$7.25 per hour ([Alsalam, 2019](#)).

Despite [Neumark \(2019\)](#) arguing that focusing on vulnerable groups in particular might help explain differences across different studies, the negative employment effect is elusive even when focusing on particularly susceptible groups like teenagers. These conclusions hold across a range of specifications, methodologies, and datasets ([Manning, 2021a](#)).

There are differences across sectors, though. [Cengiz et al. \(2022\)](#) find some evidence of reduced employment in the tradeable sectors. In line with this finding, [Harasztosi and Lindner \(2019\)](#) document disemployment effects that are greater in industries exposed to international competition.

Another type of competition that has been crucial to account for when studying the effects of the minimum wage is labor market competition. [Neumark \(2019\)](#) acknowledges the use of monopsonistic models as one of the drivers of differences in findings across studies. Recent empirical studies highlight the importance of taking the degree of labor market competition into account when studying the effects minimum wage has on employment. These studies suggest that aggregate near-zero employment effects mask substantial heterogeneity across different levels of labor market concentration. They show that the effects of the minimum wage on different local labor markets differ depending on their degree of competition. [Popp \(2022\)](#) shows that sectoral minimum wages lead to negative employment effects in slightly concentrated labor markets, while this effect weakens with increasing concentration and ultimately becomes positive in highly concentrated or monopsonistic markets. [Azar et al. \(2023\)](#) show equivalent results for three retail occupations in the US (the focus of their analysis is guided by the nature of the data they use). [Corella \(2020\)](#) finds qualitatively equivalent results for teenagers.

Most of the studies in this area focus on understanding the effects on aggregate employment (or the extensive margin), but there are few that document the effect on the intensive margin or the number of hours worked. The evidence on the number of hours worked is mixed. In the context of Seattle,

Jardim et al. (2022) show that the minimum wage leads to a reduction in hours in the short run, particularly for those with less experience. However, Dustmann et al. (2022) finds suggestive evidence that the German minimum wage induced some minimum-wage workers to move from marginal or part-time employment to full-time employment. However, more research is needed on this front, since it might well be that citywide minimum wages are completely different from federal ones (moving just outside the city is an option for a firm to avoid a city-mandated minimum wage). It could also be that Seattle and Germany are very different in terms of economic characteristics. In Germany, productivity rose more than wages during the period before the introduction of the minimum wage (Dustmann et al., 2014; Kügler et al., 2018), so in the pre-minimum wage scenario the supply of labor was likely constrained by the low wages, while the demand was not. For this reason, the introduction of the minimum wage in Germany likely increased the labor supply without decreasing the labor demand (at least in the intensive margin).

Most evidence on employment outcomes comes from studies focusing on the short-run impact of minimum wage, with few exceptions that have a longer time horizon (Harasztosi and Lindner, 2019; Cengiz et al., 2022). Studies on the short term might be biased by the existence of adjustment costs (Drechsel-Grau, 2023), and the fact that it might take time for the effects to show. Empirically, the longer the period in which one looks for effects, the more complicated it is to establish a causal link, since more changes are taking place simultaneously. In fact, over longer periods of time, the evidence is mixed. Studies like Cengiz et al. (2022) find that the overall number of low-wage jobs remained essentially unchanged over the 5 years following the increase and Harasztosi and Lindner (2019) find small negative employment elasticities even 4 years after the minimum wage reform. But Seok and You (2022) show that in the Republic of Korea increasing the minimum wage reduces employment (primarily among low-productivity workers) in the long run, implying that increasing the real minimum wage by 15% (like in 2018), eventually reduces employment in the long run by 3.5% and total output by 1%.

Other papers document a negative effect on hiring in the long run. This result would be consistent with the findings of none or negligible employment effects, as when hiring is reduced the employment stock might not be affected over the years but it could have potentially been greater in the lack of minimum wage. Jardim et al. (2022) find that in the long run there is less hiring, but hours adjust back for those employed to the initial level (undoing the initial adjustment which lead to a smaller number of hours as a response to higher labor costs). Again, however, this is a response to a citywide minimum wage hike. Some firms could be located within the commuting zone but outside the city limits, increasing employment in that zone (this possibility is discussed by the authors but no evidence is shown for or against this hypothesis). Another study finding negative effects on hiring (or employment growth in the long run) rather than immediate effects on employment levels is Meer and West (2016).

Several papers using models with putty-clay technology provide a plausible explanation for why long-run effects differ from short-run ones. However, these studies lack empirical justifications for core modeling assumptions that drive the magnitude of the short- and long-run results (for example some of these assumptions are that the input mix is fixed in the short-run, that entrants are more

capital-intensive than exiting firms, etc.) [Aaronson et al. \(2018\)](#) find that following a minimum wage hike, both firm entry and exit rise in the restaurant industry, and that there is no change in employment among continuing restaurants. The authors argue these effects are consistent with a model where continuing restaurants cannot change employment and thus industry-level adjustment occurs through the (endogenous) exit of labor-intensive restaurants and entry of capital-intensive ones. The long-run employment elasticity implied by this model is 3 to 5 times greater than the short-run one (the short-run disemployment elasticity is estimated at -0.1 , given that entry and exit results roughly offset the effects on net employment). The model extends [Sorkin \(2015\)](#) allowing for endogenous firm exit. [Hurst et al. \(2022\)](#) use a putty-clay technology model to study the (long-run) welfare impact of different policies on low-wage individuals. The authors find within the lenses of the model that minimum wage has a small employment effect in the short run, but a larger negative one in the long run (with adverse welfare consequences).

In addition, most evidence on employment outcomes focuses on for-profit employers. [Meer and Tajali \(2023\)](#) highlight how the nonprofit sector's ability to absorb increases in labor costs differs from the for-profit sector. They estimate a negative impact on employment for US states with large statutory minimum wage increases.

For LMICs results are similar. Studies for Brazil, China, Colombia, Costa Rica, Nicaragua, and Thailand have found adverse but modest employment effects of minimum wage regulation (as reviewed by [Betcherman, 2012a](#)); while studies for Mexico and South Africa have found no overall employment impact ([Betcherman, 2012a](#)). In a methodologically similar exercise, [Broecke et al. \(2017\)](#) perform both a qualitative and quantitative literature review with evidence from 14 emerging economies and reach similar results: minimum wages have only a minimal impact on employment. Interestingly, [Broecke et al. \(2017\)](#) find evidence of reporting bias toward statistically significant negative employment results.

However, other reviews focusing on LMICs provide less clear-cut results ([Belman and Wolfson, 2016](#)). Ten of the studies reviewed show the employment effects found using firm/establishment data vary substantially. The results range from negative employment effects—with one study reporting an employment elasticity among surviving firms of -0.13 —to positive ones, with a second study showing positive employment effects for new firms and no aggregate effects at the metropolitan level. Another study reviewed reports heterogeneity across firms depending on their size, by showing evidence of a total employment decline in small firms and an employment increase in large firms. Using instead household data to study employment effects, one other study finds that a rise in the minimum wage might translate into lower employment and some employment might reallocate from big to smaller firms that are not complying with minimum wage regulations (potentially rising informal employment). The authors of that study also find that sectors more likely to comply with regulations saw a decline in employment and those less likely to comply found no employment effect. Other studies found no effects on employment at all.

Across single-country studies, most of the evidence points to minimal aggregate employment effects. [Engbom and Moser \(2022\)](#) find a muted aggregate employment effect of the Brazilian minimum wage (the model predicts aggregate employment to decrease by 0.7%), given that workers in affected

firms reallocate to more productive firms. In India, [Mansoor and O’Neill \(2021\)](#) find no employment effects. In Colombia, [Pérez \(2020\)](#) finds no employment effect on the formal sector. In Mexico, in municipalities bordering the US where the minimum wage doubled in 2019, [Campos-Vazquez and Esquivel \(2021\)](#) find no statistically significant employment effects using a synthetic control approach.

For Sub-Saharan Africa, the limited research on the employment effects of the minimum wage is consistent with global evidence, i.e. introducing and raising the minimum wage appears to have a small negative employment impact or no statistically significant negative employment effect.¹³ However, there are specific country studies where substantial negative effects are reported ([Bhorat et al., 2017](#)). The country in Sub-Saharan Africa with the most comprehensive literature is South Africa, which finds a negative impact on employment in agriculture, but no employment decreases on the other covered sectors ([Bhorat et al., 2017](#)).

There is evidence of negative employment effects in the lower part of the wage distribution where the minimum wage has a direct effect. Negative employment effects are then concentrated among young people and unskilled workers and, to a lower extent, women. In countries across Asia, Latin America, and Sub-Saharan Africa studies have found that increasing the minimum wage reduced employment for these low-wage groups ([Betcherman, 2012a](#)). [Broecke et al. \(2017\)](#) find across 14 emerging economies that more vulnerable groups (young and low-experience or low-educated individuals, for example) are marginally more negatively affected. Likewise, [Engbom and Moser \(2022\)](#) reach a similar conclusion for Brazil, where they find that the close to zero aggregate employment effect masks substantial heterogeneity: employment falls by over 15% among the lowest-skill workers, while it remains unaffected for the top half of the ability distribution.

There is mixed evidence on the effect of minimum wage on informal employment ([Betcherman, 2012a](#)). In Colombia, [Pérez \(2020\)](#) finds a small negative employment effect in the informal sector of the minimum wage, which is not driven by cross-sectoral effects (as the author finds no evidence of employment effects on formal workers). [Broecke et al. \(2017\)](#) finds evidence that higher minimum wage levels lead to more informal employment across LMICs. [Engbom and Moser \(2022\)](#) find no evidence that the minimum wage caused a rise in informality in the context of Brazil.

In line with previous findings, in a meta-analysis, [Neumark and Corella \(2021\)](#) study the role different economic and institutional factors play in finding negative effects of the minimum wage on employment in LMICs. The authors show that studies with a greater *number* of these features are more likely to find negative employment effects: focusing on vulnerable workers, using data for the formal sector, covering countries where minimum wage laws are strongly enforced, and estimating effects for countries and periods with binding minimum wages.

For LMICs, there is little evidence of the adjustment of the intensive margin of labor. The only reference is [Engbom and Moser \(2022\)](#), who find no evidence of reductions in the hours worked

¹³However, in Sub-Saharan African countries the fraction of workers covered by minimum regulations is small and compliance, on average, is also low among covered workers which might partially contribute to such result. On the contrary, compared to other regions in the world, minimum wages are not set to lower levels relative to the mean wage so this might not be driving partially the result. There is though substantial variation within Sub-Saharan Africa: low-income countries do set higher minimum wages than middle or upper-income countries ([Bhorat et al., 2017](#)).

following the rise in the Brazilian minimum wage.

The impact of the minimum wage on non-wage living standards (prices, consumption, non-wage compensation, etc.): So far, we have reviewed the evidence referring to wages and employment (broadly defined). However, the availability of new data sources allow researchers to observe many other effects of minimum wages on economies, and uncover previously unknown margins of adjustment for both firms and households. Examples of these datasets are credit card information, consumption expenditure surveys, surveys on firms that report prices, etc. A summary of non-wage adjustment margins of firms is provided by [Clemens \(2021\)](#). Even when an increase in the minimum wage has no employment effects, it might have negative welfare consequences on those who intends to help, since there are many other margins of adjustment available to firms (including output prices, non-wage compensation, job attributes like effort requirements, safety measures, and the overall quality of the working environment).

Price adjustments are an important margin as reviewed by [Dube \(2019\)](#), and direct evidence of this is provided by other work. In Hungary, [Harasztosi and Lindner \(2019\)](#) show that minimum wage increases lead to increases in prices in sectors with no international competition (services), while employment declines take place in sectors with international competition and where pass-through of higher labor costs to prices is not available (manufacturing). Overall, 75% of the minimum wage increase is paid by consumers and 25% by firm owners. This paper provides evidence that the job and industry structure of a country matters. In countries where low-wage jobs are concentrated in the local service sector (such as Germany or the US) raising the minimum wage is likely to cause limited negative employment effects, but important price increases. In cities where mainly high-income consumers enjoy services provided by low-wage workers, this redistribution will be from rich to poor. The heterogeneous responses across industries also highlight the advantages of sector-specific minimum wage policies used in some European countries such as Italy or Austria. Setting a higher minimum wage in the non-tradable sector than in the tradable sector can push up wages relatively more where it will generate more modest disemployment effects. This, however, would likely translate into a reallocation of workers from one industry to another, leading to further adjustments in the wages across the different industries (in general equilibrium). The estimates in [Harasztosi and Lindner \(2019\)](#) can be used to evaluate other policies that affect the cost of labor such as taxes and subsidies. The results also suggest that such policies can induce sizable responses in the exporting and tradable sectors. The finding of price increases driven by non-tradable sectors is supported for the US ([Cooper et al., 2020](#)).

Evidence of price increases following minimum wage hikes is also present in some LMIC contexts. [Calderón et al. \(2023\)](#) disentangle the effects of an increase in the minimum wage as well as a decrease in the Value Added Tax on prices in the northern Mexican border. They find that the minimum wage hike led to increases in prices, which were more than offset by the VAT reduction. They also find the minimum wage's price effect varied based on the level of labor informality: goods subject to the VAT, which are mainly produced using a higher share of formal labor, were more likely to increase their price due to the minimum wage hike. However, [Belman and Wolfson \(2016\)](#) find no evidence of effects on prices by the minimum wage in the one paper reviewed that studies

effects on inflation.

On adjustments of non-wage compensation following a minimum wage hike, there is mixed evidence. [Clemens et al. \(2018\)](#) shows employer-sponsored health insurance decreases. This is true not only for minimum wage workers but for workers initially above the minimum wage, suggesting there are spillover effects. However, [Harasztosi and Lindner \(2019\)](#) finds no evidence that firms tried to offset the minimum wage increase by cutting non-wage benefits in Hungary; and by exploiting cross-state US variation in the bite of Walmart's 2014 corporate minimum wage, [Dube et al. \(2022\)](#) find no evidence that non-wage amenities are reduced in response to a higher corporate minimum wage, consistent with the existence of a wage-amenity complementarity and labor market power. There is also evidence referring to the effect of minimum wage increases on training provision, which can be considered another example of non-wage compensation. Training might not directly translate into better living standards, but it might also affect labor market outcomes indirectly. [Bellmann et al. \(2017\)](#) do not find a reduction in the training incidence but a slight reduction in the intensity of training at treated establishments, mostly driven by employer-financed training. However, against what one might think at the worker level the reduction of training affects medium- and high-skilled employees while it has no significant effects on the training of low-skilled employees.

Commuting time, a relevant factor for individual well-being, rises following a minimum wage increase according to some evidence: [Dustmann et al. \(2022\)](#) finds that following the introduction of the German minimum wage, which led to an important labor reallocation, commuting time increased, potentially leading to a decline in well-being.

The minimum wage impacts household consumption and access to credit. The evidence shows minimum wage hikes help some households overcome credit constraints and might incentivize the purchase of durable goods that could lead to efficiency gains. [Aaronson et al. \(2012\)](#) show that a minimum wage increase leads to a rise of income and an increase in debt-taking for affected household, evidencing that it lifted credit constraints.¹⁴ The increase in consumption is driven by few households who invest in durable goods (i.e. vehicles) via credit. [Cooper et al. \(2020\)](#) find that the minimum wage led to a modest rise in nominal spending (as well as in prices). The authors find evidence of a macroeconomic effect, showing that gains are larger for certain subcategories such as food away from home (an industry with an important share of minimum wage workers) and in locations where low-wage workers account for a larger share of employment, likely rising the demand for labor despite higher labor costs. However, part of the increase in demand for goods and services might be compensated for by the increase in prices (particularly relevant in the non-traded sector). Furthermore, the minimum wage increase is associated with reduced total debt among households with low credit scores, higher automobile debt, and increased access to credit.

In the context of a developing country, [Mansoor and O'Neill \(2021\)](#) find that household consumption increases in India following minimum wage increases. However, the extent of the effect on consumption depends on level of compliance with the minimum wage regulation.

¹⁴The authors interpret household behavior in such a way given the timing of the response. The rise in consumption (and debt) did not take place at the time when the increase of the minimum wage was approved (ruling out the interpretation that agents are risk-averse agents) but rather at the time when it was implemented.

The evidence reviewing the effects of minimum wages on non-wage outcomes in LMICs also highlights the effects on outcomes not studied in the context of developed countries, like entrepreneurship and migration (and their macroeconomic consequences). [Kong et al. \(2021\)](#) find a negative and statistically significant effect on entrepreneurship in China, particularly in labor-intensive industries and in areas with higher labor costs or with low access to finance. [Sy and Hosoe \(2022\)](#) use a structural model to argue that raising the minimum wage in the Philippines increases emigration and leads to an increase in remittances. Remittances increase welfare but in turn have macroeconomic consequences such as currency appreciation, causing a decrease in domestic production in labor-intensive and export-oriented sectors and an erosion of the tax base (since remittances are not taxed).

4.2.2 Minimum Wage: Impact on Productivity

Most existing evidence suggests that productivity increases following a minimum wage hike. First, there is evidence that the smallest, less productive firms exit the market; thus leading to aggregate productivity increases ([Dustmann et al., 2022](#)) by a pure composition effect. This has important geographic implications since average establishment quality increases in more affected areas in the years following the introduction of the minimum wage. The size of firms increases as well (with implications for market concentration, now higher). [Aaronson et al. \(2018\)](#)'s results imply increases both in aggregate and in labor productivity following the exit of labor-intensive firms and entry of capital-intensive ones. For LMICs, [Belman and Wolfson \(2016\)](#) show mixed findings on the effect of minimum wage on firms' exit. There is suggestive evidence though, that the rise in the minimum wage increases the exit of firms with low labor productivity, leading to improved productivity of surviving firms as an adjustment to the higher minimum wage.

Consistent with these results, hiring practices of different firms may be effected by the minimum wage. [Engbom and Moser \(2022\)](#) find that with the squeeze of profit margins following Brazil's minimum wage increase, low-productive firms cut vacancy posting while highly productive firms increase vacancy posting (since it is easier to hire workers), increasing aggregate productivity by 3% (and output by 1%).

Second, establishments increase their capital expenditures and capital stock in response to minimum wage increases in the medium run, according to some evidence, suggesting that capital-labor substitution plays a crucial role ([Harasztosi and Lindner, 2019](#)). A higher capital stock is associated with productivity increases in the medium and long run. In a study for Korea, [Seok and You \(2022\)](#) argue that the rise in capital investment, is facilitated by the long-run increase in labor productivity for employed workers which was triggered by the minimum wage.

Third, when it comes to human capital accumulation, the evidence is mixed. [Bellmann et al. \(2017\)](#) do not find a reduction in the training incidence but a slight reduction in the intensity of training at treated establishments, driven by employer-financed training. With more important aggregate implications, [Bárány \(2016\)](#) shows in a general equilibrium model that the minimum wage alters the incentives to attain post-compulsory education, since it directly affects the college premium, i.e. the difference in wage between the college and non-college educated. A decrease in the real minimum

wage (as it took place in the US) increases college attendance for those at the top end of the ability distribution while it decreases it at the lower end (as jobs are plentiful given lower labor costs there is no need to get further education), leading to an increase in income inequality. There is also suggestive evidence that job-specific human capital could increase following lower turnover found by [Jardim et al. \(2022\)](#), which could potentially translate into higher labor productivity. This last result could help explain why returns to experience are positive in the formal sector, while in the informal sector the profile of wages is flat.

Fourth, the evidence on skill upgrading following a minimum wage increase which would naturally lead to productivity gains via changes in the stock of human capital is mixed. While [Neumark \(2019\)](#) mentions the existence of labor-labor substitution as one potential explanation to the lack of aggregate employment effects found in the literature and [Clemens et al. \(2021\)](#) finds that there is an (upwards) adjustment of requirements both within and across firms following a minimum wage hike, other studies do not reach the same conclusion. [Cengiz et al. \(2022\)](#) do not find any evidence of labor-labor substitution. Neither does [Forsythe \(2022\)](#): there is no evidence of substantial restructuring of production consistent with labor-labor substitution. This evidence would also be consistent with [Aaronson et al. \(2018\)](#), who argue that establishments are unable to easily adjust their input mix in response to policy changes, and thus aggregate adjustments are driven by establishment entry and exit.

4.2.3 Minimum Wage: Impact on Social Cohesion

The evidence of the impact the minimum wage has (more or less directly) on social cohesion shows that while the minimum wage might not be relied upon exclusively to increase social cohesion, it might be an effective tool to do so in combination with other policies.

There is evidence the minimum wage led to a decline in racial earnings inequality during the civil rights era of the 1960s–1970s in the US: [Derenoncourt and Montialoux \(2021\)](#) show that the minimum wage can explain more than 20% of the reduction in racial earnings inequality during this period.

On whether minimum wage is a good policy to redistribute and to reduce *household* inequality and poverty, the evidence is mixed. There is some evidence arguing that the minimum wage is an effective redistributive policy. [Harasztosi and Lindner \(2019\)](#) find that while the minimum wage raises the income of low-wage workers, the higher output prices that it leads to are more or less equally shared among consumers, as shown by the similar consumption patterns between rich and poor households. With a similar argument, [Aaronson et al. \(2012\)](#) show that for the US, household inequality decreases with the minimum wage, since income of households with workers earning at least double the minimum wage is not affected while for those with minimum wage workers increases. Other evidence argues against the minimum wage as a redistributive policy. [MaCurdy \(2015\)](#) shows that the minimum wage is not an effective tool to reduce poverty (as was previously thought) since it increases price products. [Cahuc \(2022\)](#) reaches similar conclusions, arguing that some minimum wage workers might not be in low-income households. A similar argument is made by [Burkhauser et al. \(2023\)](#) who argue that less than 10% of those whose hourly wage rate would be

directly impacted by a \$15 minimum wage in the United States live in poor families.

Across LMICs, the antipoverty effect of the minimum wage is not obvious either. Those in the poorest households might not be the ones benefiting from the minimum wage rise, or might suffer employment losses (Gindling, 2018; Betcherman, 2012a). In the Philippines, Sy and Hosoe (2022) find that the minimum wage raises household inequality due to some of those affected leaving the country and sending back remittances, with further macroeconomic consequences (appreciation of the currency, loss of jobs in the tradable sector, etc.). There is evidence that the minimum wage also reduces crime rates. Braun (2019) finds minimum wage increases lead to a crime reduction among young individuals in the US.

The impacts of minimum wages on living standards, productivity and social cohesion are summarized in Table 3.

4.3 Employment Protection Legislation

Employment protection legislation regulates the initiation and termination of employment.^{15 16} More specifically, it sets which employment contracts are permitted and the conditions under which they can be used. It also determines the conditions under which employment can be terminated and the procedures to be used in termination (advanced notice, severance payments, special requirements for collective dismissals, etc.).

Employment protection legislation refers to all types of employment protection measures, originated by legislation, court rulings, collectively bargained conditions of employment or customary practice. These provisions are enforced through the worker's right to appeal against termination.

There are efficiency considerations of too much or too little employment protection. The optimal scale of employment protection policies balances firms' needs—for flexibility to adjust their labor force to deal with demand shocks, technology shocks, and cost changes—with workers' living standards and need for stable jobs and incomes. New digital technologies behind the "gig economy" may enhance firms' demand for flexibility, but they also impose new challenges for employment protection legislation, including how to protect gig workers along with whose tasks may be replaced by digital technologies (Almeida et al., 2018).

The nature of these restrictions is quite similar in all countries, but the actual processes and the overall degree of stringency vary considerably.^{17 18} While the US, New Zealand, Canada, the UK, and Hungary have fairly unrestrictive individual dismissal regulations (the US being the least restrictive); regulations in the Czechia, Portugal, France, the Netherlands, and Germany are far

¹⁵The terms "employment protection rules" or "job protection legislation" are used synonymously.

¹⁶Legislation about fair labor conditions might also be considered to fall under the umbrella of employment protection legislation. For instance, Abman et al. (2023) and Lakdawala et al. (2023) study the effects of implementing and expanding workers' rights to child workers. However, legislation around fair labor conditions, including child labor conditions, falls outside the scope of our review.

¹⁷See the OECD indexes for reference.

¹⁸While some aspects of employment protection rules, like the length of advance notices and the dimension of severance payments, can be measured with precision, other important features, such as the willingness of labor courts to entertain appeals by fired workers and how judges interpret what is a "just cause" for termination, are much more difficult to quantify.

Table 3: Impacts of minimum wages on living standards, productivity and social cohesion

Indicator	Findings	Range of estimates	Details
<i>Living standards</i>			
Employment	Decreases (small negative effect on average) Decreases	Median own wage elasticity -0.17 across US states (Dube, 2019)	Stronger negative effects for the tradable sector and the more competitive labor markets (the least competitive labor markets see employment increases), some evidence pointing to 3-5 times more negative long-run impact (Aaronson et al., 2018). More negative employment effect for vulnerable groups
Employment (particular groups)	Increase Decreases		For workers directly affected, for other workers: evidence of spillover effects.
Labor earnings (particular groups), labor earnings inequality	Increase Decreases		
Consumption	Increase	75% of the minimum wage increase paid by consumers (higher prices) and 25% by firm owners (lower profits) (Harasztosi and Lindner, 2019)	Durable goods (e.g. cars) following relaxation of credit constraints. Particularly in sectors not exposed to international competition (i.e. trade-off between employment-price adjustment).
Prices	Increase		
<i>Productivity</i>			
Productivity	Increases		Labor and multifactor productivity increase via skill upgrading and firm entry/exit respectively.
Labor reallocation	Increases		Towards bigger firms
Physical and human capital	Physical capital increases, evidence on human capital mixed		Evidence of increases in capital stock (capital-labor substitution in medium/long run). College education attainment decreases (increases) for lowest (highest) ability individuals, decreasing overall; job-specific human capital might increase (by lower turnover).
<i>Social cohesion</i>			
Social cohesion	Increases		Teen crime rates decrease; poverty/household inequality: uncertain effect (not all workers earning minimum wage are in the poorest households), complementary policies needed.

Notes: The category *Labor earnings (particular groups)*, *labor earnings inequality* includes both earnings inequality and effects on specific groups. The category *Prices* includes debt.

stricter than the OECD average. In many developing and emerging economies (for example, China, India, Indonesia, and the Russian Federation), stringent employment protection is weakly enforced, and many workers in the informal sector are unprotected (Scarpetta, 2014).

There has been a clear tendency to reduce the degree of stringency of employment protection following the Great Recession, mostly focused on regulations governing individual and collective dismissals (OECD, 2013). However, in numerous instances flexibility has been introduced at the margin via temporary contracts without relaxing stringent employment protection legislation on open-ended contracts, contributing to labor market segmentation (Scarpetta, 2014). This in turn has had important economic consequences. Segmented or dual labor markets are labor markets where there are insiders, with open-ended or permanent contracts covered by generous employment protection; and outsiders, under temporary or fixed-term contracts and with little protection. Historically, fixed-term contracts (FTCs) were introduced to add more flexibility to the labor market, without the political cost of reducing the benefits of open-ended contracts (OECs) (Bentolila et al., 2019). Duality has demographic implications since workers with a more marginal attachment to the labor force, those who mostly are under temporary contracts, tend to be disproportionately younger, less educated and, to a lower extent, women.

4.3.1 Employment Protection Legislation: Impact on Living Standards

The impact of employment protection on employment: There is no clear relationship between employment protection legislation and unemployment rates. The result that firing costs have an ambiguous effect on unemployment tends to hold for dual labor markets. There is, however, evidence that dual labor markets see increases in unemployment when collective bargaining is controlled by insider workers under OECs (Bentolila et al., 2019).

Employment protection legislation affects job and labor market flows, according to some evidence. By raising labor adjustment costs, stringent employment protection reduces job creation as well as job destruction (Scarpetta, 2014). In particular, higher firing costs induce less hiring but also less firing (lower turnover). However, duality induces changes in the organization of production leading to high labor turnover rates, detrimental to productivity growth. In dual labor markets, this outcome overcomes the potentially beneficial role of FTCs as stepping stones toward more stable jobs, having negative effects on job stability (Bentolila et al., 2019). In line with this evidence, Hijzen et al. (2017) argue that employment protection legislation leads to greater use of temporary contracts and greater turnover (i.e. greater hires and separations) in Italy, a country with a dual labor market.

The impact of employment protection on wages and labor earnings: Employment protection legislation impacts income. There is evidence that higher firing costs might reduce wages. Duality induces changes in the organization of production leading to high labor turnover rates, detrimental to productivity growth. In dual labor markets, this outcome overcomes the potentially beneficial role of FTCs as stepping stones toward more stable jobs, having negative effects on wages and increasing wage inequality. The impact of duality on wage inequality is stronger if collective bargaining is controlled by insider workers under OECs (Bentolila et al., 2019). Another way in

which employment protection rules affect income is via severance laws. In countries lacking unemployment benefits (as is the case in most LMICs), severance payments might be the only source of income available to support the job search.

FTCs might be a stepping stone in some countries, if they represent a first step toward an OEC, and a dead end in others. There is empirical evidence both in favor and against the stepping-stone hypothesis, but it is geographically segmented. The evidence in favor mostly refers to countries with low firing costs on OECs and a lower prevalence of FTCs, in some cases through temporary work agencies. These countries include Austria, Denmark, Germany, Sweden, the Netherlands, the UK, and the US (but even for these countries there are conflicting results). On the other hand, the evidence against the stepping-stone hypothesis comes from mainly dual labor markets with high employment protection legislation gaps and a high FTC incidence, such as Italy and Spain. Theoretically, where employment protection legislation gaps are small, FTCs facilitate access to more stable jobs. Evidence shows there is a stronger stepping-stone effect when FTCs are used for training, especially in countries with strong vocational education systems where FTCs facilitate screening as well (Austria and Germany). On the other hand, with large employment protection legislation gaps, the screening role fades and the buffer role prevails, so that employers organize production to have a large share of FTC workers, most of whom are unlikely to be promoted to an OEC.

In Spain, the use of FTCs has been associated with long-lasting negative effects on labor market outcomes, which likely are also present in other dual labor markets. [García-Pérez et al. \(2019\)](#) track the cohorts of male high school dropouts entering the Spanish labor market around the time of the 1984 reform, which strongly liberalized the use of FTCs. They find that the cohort entering the labor market after the reform had a larger probability of working before age 19. However, over their first 10 years in the labor market, they had less days of work (5%) and lower earnings (10%); and over the first 27 years of their careers, yearly earnings losses still amounted to 7.3%. No effects are found however for high school graduates.¹⁹

There is evidence that labor market concentration impacts job security. More specifically, greater concentration in the labor market has a (negative) impact on job security. Greater labor market concentration is associated with a lower probability of being hired on a permanent contract and in dual labor markets, with a lower probability of being converted to a permanent contract after being hired on a FTC ([Bassanini et al., 2022](#)).

Counterintuitively, ([Jimenez and Rendon, 2022](#)) find an increase in firing costs in Peru *increased* permanent contract employment by 2.5 percentage points. A 2002 Peruvian Supreme Court ruling reestablished workers' right to reinstatement for unfair dismissals in the country. Through a differences-in-differences model, the authors find this ruling increased permanent contract hiring in large firms. They suggest that collective bargaining could have played a role: unions, by law, could only exist in these large firms, and the right to reinstatement could have increased their bargaining

¹⁹The extended use of FTCs has even more far-reaching implications toward other labor market policies, and in this case mandated benefits. When these workers under very short-term FTC contracts reach pensionable age, it is unlikely that their history will meet statutory requirements for a contributory pension, so they will fall into much less generous assistance pensions.

power, leading to an increased availability and accessibility of permanent contracts.

4.3.2 Employment Protection Legislation: Impact on Productivity

The flexibilization of job protection rules via temporary contracts, which leads to increased labor market segmentation, has negative consequences on productivity. When labor markets are dual, higher firing costs and overall more stringent job protection legislation are associated with changes in the organization of production leading to high labor turnover rates and greater use of temporary work arrangements, with a detrimental effect on productivity growth (Bentolila et al., 2019; Hijzen et al., 2017).

However, the use of temporary contracts has been found in other instances to contribute positively to productivity, as is the case in India. In the context of a size-dependent policy preventing employment-adjustment of (only) large firms, Bertrand et al. (2021) study how an interpretation of the law by the judiciary contributed to the rise of contract labor as a way to circumvent the original regulation, rising TFP in Indian manufacturing by 7.6%.

Other ways of introducing flexibility, such as allowing for discretion to retain workers instead of applying seniority rules, have also led to increased labor productivity. Bjuggren (2018) shows that a 2001 reform increasing the discretionary capacity of firms in Sweden to decide what workers to retain (rather than seniority rules) increased labor productivity by a magnitude equivalent to average annual labor productivity growth.²⁰

There is evidence of multiple ways in which employment protection legislation affects productivity. The first is via human capital formation. More stringent employment protection rules (in the form of higher firing costs) lead to less firing (lower turnover), which might increase productivity (Bentolila et al., 2019). More stable jobs give incentives to workers to accumulate firm-specific knowledge. Furthermore, protections might also give incentives to firms to invest in training and human capital. In the same direction, more lenient employment protection legislation (using a greater share of FTCs) leads to lower productivity growth. This is partially driven by composition effects: there is evidence that FTC workers are less productive than OEC workers and that a higher FTC share leads to lower productivity growth (Bentolila et al., 2019). However, it is also the case that firms tend to invest less in training their temporary employees than their permanent employees (Bentolila et al., 2019). Temporary contracts are associated with a 6.5 percentage points lower probability of on-the-job training in Spain (Cabralés et al., 2017). Furthermore, Dolado et al. (2016) find that when the conversion rate from a temporary contract to a permanent one decreases (i.e. when the gap in firing costs between permanent and temporary workers increases), temporary workers exert less effort and firms react by providing less training. Moreover, evidence exploring cross-country variation shows that on-the-job training gaps between permanent and temporary contracts are lower in European labor markets where dualism is less salient (relative to those where it is more extended). These examples could constitute a plausible explanation for why temporary

²⁰Other countries with employment protection that involves priority rules in the case of redundancy: Austria, France, Germany, Greece, Italy, China, the Netherlands, etc. In addition, priority rules are common practice within certain sectors. In the United States, most layoffs in school districts are determined by seniority rules.

contracts become dead ends in dual labor markets while they act as stepping stones toward stable jobs in others (Cabrales et al., 2017).

The second way employment protection legislation affects productivity is via the speed at which employment protection allows employment adjustment to take place. More stringent employment protection might be bad for productivity since it can slow down the employment adjustment process and the ability of economies to redirect labor resources to the most productive uses (Scarpetta, 2014). Studying a policy change in Belgium that increased employment protection for blue-collar workers (and decreased it for white-collar workers), Alpysbayeva and Vanormelingen (2022) find evidence suggesting a negative impact of employment protection on productivity through this channel. In particular, they find the policy lowered the allocative efficiency of firms that hired more blue-collar workers relative to white-collar workers.

Likewise, by raising labor adjustment costs, stringent employment protection weakens firms' ability to exploit new (and potentially riskier) technologies and markets (Scarpetta, 2014). In line with this evidence, Caballero et al. (2014) exploit variation across 60 countries to show that more stringent job protection rules slow down the employment adjustment process when in a recessionary/expansionary period, leading to lower productivity growth. Bertrand et al. (2021) show, in the context of a size-dependent policy preventing employment-adjustment of (only) large firms, how an interpretation of the law by the judiciary contributed to the rise of contract labor as a way to overpass the original regulation, rising TFP in Indian manufacturing by 7.6% following a one-time reduction in the misallocation of labor between small and large firms. They also find evidence that the probability that large firms introduced new products rose.

Other channels mentioned in the literature by which job protection might impact productivity include: (a) capital deepening, introducing some discretion to retain what workers rather than applying seniority rules, might lead to capital deepening contributing to higher productivity (Bjuggren, 2018); and (b) temporary workers' effort (Dolado et al., 2016), when the conversion rate from a temporary contract to a permanent one decreases (i.e. when the gap in firing costs between permanent and temporary workers increases), temporary workers exert less effort lowering productivity.

The impacts of employment protection rules on living standards and productivity are summarized in Table 4.

4.4 Unions and Collective Bargaining

Collective bargaining is the negotiation process that takes place between employees (via unions) and their employers over wages and working conditions (i.e. working time, training, occupational health and safety, etc.).²¹ Collective agreements are the outcomes of these negotiations. The coverage offered by collective bargaining differs across types of workers. Some do not have the right to bargain collectively over wages (this is the case for workers in public services who may have their wages determined by state regulation or other methods involving consultation), others are covered by more

²¹International Labor Office (2017) has been a crucial source for this introduction.

Table 4: Impacts of employment protection rules on living standards, productivity, and social cohesion

Indicator	Findings	Range of estimates	Details
<i>Living standards</i>			
Employment	Uncertain effect		Also in dual labor markets: impact of duality on unemployment is stronger if collective bargaining is controlled by workers with permanent contracts.
Labor earnings	Decrease		Higher firing costs reduce wages
Labor earnings (particular groups), labor earnings inequality	Inequality increases (in dual labor markets)		Even more so if collective bargaining is controlled by workers under permanent contracts.
<i>Productivity</i>			
Productivity	Mixed evidence		Temporary contracts usually associated with lower productivity (but not always). Positive productivity effect of discretionary rules to retain workers (instead of seniority).
Labor reallocation	Mixed evidence		More stringent job protection might slow-down reallocation as it decreases turnover; but evidence of high labor turnover rates in dual labor markets.
Physical and human capital	Mixed evidence		More stringent job protection increases the incentive to accumulate firm-specific knowledge; workers under temporary contracts (more flexible job protection) receive less training.
<i>Social cohesion</i>			
Social cohesion	No evidence		

Notes: The category *Labor earnings (particular groups)*, *labor earnings inequality* includes both earnings inequality and effects on specific groups. The category *Prices* includes debt.

than one collective agreement. The coverage and impact of collective agreements also vary over time and across countries. There is significant variation on the share of workers covered by at least one collective agreement across different countries; ranging from 1 to 2% of employees in Ethiopia, Malaysia, the Philippines, and Peru to nearly 100% in France, Belgium, Austria and Uruguay.

Collective bargaining is the core activity of most trade unions. One might then expect that the higher the unionization rate, the greater the share of workers covered by collective agreements. However, there are significant disparities across countries. While in most LMICs both the unionization rate and the bargaining coverage rate tend to be relatively low, there are examples of developed countries with low levels of collective bargaining coverage and low union density (UK, US, Korea, for example) and with high levels of collective bargaining coverage and high union density (Iceland, Finland, Sweden, Denmark). Some countries though have higher collective bargaining coverage than union density (France being the most extreme case, with a collective bargaining coverage close to 100% and a unionization rate below 10%). This comes from the fact that employers apply the collective agreement (signed by a union and thus for union members) also to non-union members. In some countries employers are required by law to do so. However, this can leave unions with a problem of free riding.²²

Collective bargaining can involve in the negotiations a single employer (single-employer bargaining) or multiple employers (multi-employer bargaining). Multi-employer bargaining takes place at the sector and/or territory level (region-wide or nation-wide). Under multi-employer bargaining employers come together in associations with a mandated to bargain. This might contribute to a higher than unionization rate bargaining rate since small and medium enterprises, many of which are not unionized, are included in the bargaining, and when agreements include nationwide sectors that may not be unionized, such as retail, hotel and catering, cleaning, etc. In short, industry or national bargaining can help establish minimum standards for working conditions in an industry or sector, taking these out of competition. In the countries where coverage rates exceed union density rates by a large margin, bargaining takes place at the sectoral and/or national level. Multi-employer bargaining at the sectoral or national level is the most inclusive form of collective bargaining. With the increasing heterogeneity of enterprises within an industry or country, the costs of reaching and administrating multi-employer agreements tend to rise.

Under single-employer bargaining, each employer bargains independently (at the plant or firm level). Only a limited number of employees tend to be covered, usually those in large and medium-sized enterprises or units. In some countries with single-employer bargaining, bargaining still takes place across multiple employers in some instances (the state of Quebec, health services in the UK, construction sector in Ireland, etc.).

Wherever multi-employer bargaining breaks down and is replaced by single-employer bargaining, the coverage rate decreases dramatically, as fewer enterprises choose to recognize trade unions and negotiate collective agreements (for example in the UK in the 1980s–1990s, and New Zealand in the 1990s). There have also been more recent episodes when the coverage of collective agreements has

²²An alternative system, the Ghent system, gets around this problem by making unions provide unemployment insurance financed via government subsidies, increasing union membership rates. This system is still in place in some Nordic countries (Denmark and Finland).

declined like during the Great Recession, but there is heterogeneity across countries. While the bargaining coverage increased in countries such as Australia, the Netherlands, Brazil, Switzerland and it remained stable in countries like France and Belgium; it declined in others. In Germany the decline was already ongoing (driven by declines in the number of collective agreements being extended and in union membership, and an increase in the use of opening clauses permitting derogations from collective agreements and the possibility of membership in employers' organizations 'unbound by collective agreements'. In the US, UK and Japan the decades of erosion of enterprise bargaining continued. While the sharpest decline took place in the most affected countries of the Eurozone as a result of policy prescribed by multilateral financial institutions in the rescue packages, which limited the continuity of collective agreements beyond expiration, suspended or made more difficult to apply extension provisions, etc.

4.4.1 Unions and Collective Bargaining: Impact on Living Standards

The impact of unions and collective bargaining on employment: As put by [Blanchard et al. \(2014\)](#), “theory makes ambiguous predictions about the effect of centralized collective bargaining on the level of unemployment. On the one hand, with centralized bargaining, worker representatives are more likely to put some weight on the welfare of the unemployed than they are under decentralized, firm-level bargaining. Other things being equal, this should lead to lower unemployment. On the other hand, relative to firm-level bargaining, centralized bargaining increases the bargaining power of unions, which may lead to higher wages and thus higher unemployment.” However, the evidence arising from the cross-country comparison of stylized facts, associates centralized (decentralized) wage-setting processes, with higher (lower) unemployment ([Cahuc, 2022](#); [Kügler et al., 2018](#); [Dustmann et al., 2014](#)).

The impact of unions and collective bargaining on wages and labor earnings: When it comes to wages, the evidence points to unions and centralized bargaining leading to higher wage growth and to lower inequality. [Stansbury and Summers \(2020\)](#) argue that measures of reduced worker power (such as lower unionization rates) are associated with lower wage levels in the US.²³ When it comes to the effect on wage growth of specific wage-setting bargaining processes, there is evidence that wages grow with productivity growth under centralized bargaining and below productivity growth when bargaining is decentralized ([Cahuc, 2022](#); [Kügler et al., 2018](#); [Dustmann et al., 2014](#)). Further evidence shows that under sectoral bargaining wages adjust to negative firm-specific and macroeconomic shocks if there is enough flexibility at the firm level ([Card and Cardoso, 2021](#)). In Portugal (unlike in the US), collective agreements at the sectoral level set wage floors while employers decide their wage cushions (wage premiums). Although wages bunch at the wage floor, a typical worker receives a 20% premium over the floor, with larger cushions for older and better-educated workers and at higher-productivity firms. It is the existence of these cushions that allow wages to covary with firm-specific productivity, even within sectoral agreements. Contract negotiations tend to raise all wage floors proportionally, with increases that reflect average

²³The authors also bring forward other macroeconomic implications arising from the decline in worker power, such as higher profit shares and reductions in the measures of the non-accelerating inflation rate of unemployment (NAIRU).

productivity growth among covered firms. As floors rise, however, cushions are compressed, leading to an average pass-through rate of about 50%. In the context of the Great Recession (2008–2016), as part of the debt relief package, there were legislative changes that would reduce the coverage of sectoral bargaining. However, this effort largely failed. Nevertheless, significant downward real wage adjustments occurred within the existing bargaining system, which allowed for downward wage adjustment via reductions in real wage floors, reductions in real wage cushions and a reallocation of workers to lower wage floors.

When it comes to differences across workers, overall, unskilled workers tend to do better under industry-wide or economy-wide bargaining, whereas skilled workers gain more from company bargaining, especially where it allows for some individual pay bargaining. Multi-employer bargaining tends to offer more inclusive labor protection for vulnerable categories of workers, such as migrant workers, those in non-standard forms of employment and workers employed in small firms ([International Labor Office, 2017](#)). In other words, decentralized wage bargaining is associated with a wider wage distribution, while centralized bargaining is associated with a more compact wage distribution.

Further evidence of this is the fact that the specific level of unionization is negatively related to the level of wage inequality and inequality across different types of capital ([Fortin et al., 2021](#); [Farber et al., 2021](#); [Azkarate-Askasua and Zerecero, 2022](#)). [Fortin et al. \(2021\)](#) show that over the period from 1979–2017 de-unionization contributed to the rise in income inequality. [Farber et al. \(2021\)](#) focus on a wider time span (pre-1973, year in which household surveys start capturing union affiliation information) to show that the direct effect of unionization accounts for 46% of the decline in the 90–10 gap between 1936–1968 and 16% of its increase between 1968–2014. [Azkarate-Askasua and Zerecero \(2022\)](#) argue that unions (and collective bargaining) have a large distributional effect across different types of capital in the context of France, by showing that the labor share without unions would be reduced by almost 10 percentage points.

Some of the effect unions have on inequality arises via spillover effects and by the threat of non-organized workers unionizing. [Fortin et al. \(2021\)](#) find that over the period from 1979–2017, the threat effect doubled the contribution of de-unionization to the rise in wage inequality in the United States. For instance, in the case of men, the contribution of unions to the steady growth in the 90–50 gap over the entire 1979–2017 period goes from 20% to 40% when spillover effects are taken into account. These are similar findings to [Farber et al. \(2021\)](#), who focusing on a wider time span find important contributions of spillover effects to the non-covered sector via threat effects, and that spillover effects increase the role of unions in the change of inequality.

The impact of unions and collective bargaining on productivity. The evidence on the effect of collective bargaining on productivity is more limited than on living standards. Still, collective bargaining, its coverage, and the level of negotiation, have been found to impact efficiency and productivity.

The traditional view is that unions enhance worker productivity (and thus overall productivity) by increasing job security and lowering turnover. However, more recently the argument has shifted toward the idea that specific forms of collective bargaining, such as industry-wide collective

bargaining, might restrict the capacity of firms to respond to market changes contributing negatively to both efficiency and productivity. In this line, since the Great Recession a view has become more common view that what is best for efficiency considerations is a system allowing for decentralized wage setting (to account for differences across sectors, regions, firms) while keeping coordination to facilitate adjustment over aggregate shocks. A combination of firm-level agreements (to adjust wages to specific conditions faced by firms) and national agreements (to set floors and coordinate the adjustment in response to major macroeconomic shocks) might be best (Blanchard et al., 2014).²⁴ Card and Cardoso (2021) show that a similar system (with sectoral bargaining rather than national one) allowed for wage adjustment in Portugal in the aftermath of the Great Recession. However, the literature provides mixed views and the evidence does not always point toward the idea that industry-wide bargaining leads to negative effects on productivity. In the context of France—where collective bargaining might happen simultaneously at different levels (for example, nationally, industry and firm/plant) but where industry-wide agreements have the widest coverage—Azkarate-Askasua and Zerecero (2022) argue that unions seem to have no negative efficiency effects given the presence of employers’ labor market power. Indeed in a structural model with both employer and union labor market power, the authors show that removing the bargaining process would marginally reduce output compared to the baseline; or in other words, that the bargaining process is having a positive impact on output. Likewise, Kügler et al. (2018) present stylized facts that one cannot argue that different collective bargaining regimes impact productivity differently. The authors show that despite wide bargaining coverage in France and declining bargaining coverage in Germany, by shifting from a sectoral to a more decentralized firm-level regime, both countries saw very similar productivity growth over the period from the mid-1990s to the mid-2010s. In developing economies, though, work rules negotiated at the firm level tend to be associated with greater labor productivity compared to when work practices are bargained at higher national or industry-wide levels. Most of this evidence arises from Latin American countries. However, the relationship is not causal, and evidence and institutions vary across LMICs, making it difficult to generalize the effects of unions and collective bargaining (Lamarque, 2015). The literature on LMICs is mostly silent on the channels via which bargaining impacts productivity given the lack of suitable data (Lamarque, 2015).

4.4.2 Unions and Collective Bargaining: Impact on Social Cohesion

Collective bargaining can result in greater social cohesion. Collective agreements yield labor protection to workers, legitimacy of rules and stability to employers, and provide public authorities with a form of regulation decided by the social partners and thus tailored to their circumstances. Multi-employer bargaining at the sectoral or national level is the most inclusive form of collective bargaining (International Labor Office, 2017).

The impacts of unions and collective bargaining on living standards, productivity and social cohesion are summarized in Table 5.

²⁴Historical examples are the Wassenaar Agreement in the Netherlands in 1982 and the Moncloa Pact in Spain in 1977, which are both credited with dramatic improvements in labor markets in difficult circumstances.

Table 5: Impacts of unions and collective bargaining on living standards, productivity, and social cohesion

Indicator	Findings	Range of estimates	Details
<i>Living standards</i>			
Employment	Decreases		Decentralized bargaining associated with lower unemployment.
Labor earnings	Mixed evidence		Centralized bargaining leads to higher wage growth; decentralized bargaining associated with higher wages for white-collar and lower for blue-collar workers; unions have a positive effect on wages of both unionized and non-unionized workers (spillover effects).
Labor earnings (particular groups), labor earnings inequality			Decentralized bargaining associated with higher inequality; unionization rate negatively associated with income inequality.
<i>Productivity</i>			
Productivity	Mixed evidence		If employers have labor market power no efficiency effects of unions and collective bargaining
Labor reallocation			Centralized bargaining might decrease productivity if it prevents reallocation
<i>Social cohesion</i>			
Social cohesion	Increases		Multi-employer bargaining at sectoral or national level is most inclusive.
Notes: The category <i>Labor earnings (particular groups)</i> , <i>labor earnings inequality</i> includes both earnings inequality and effects on specific groups. The category <i>Prices</i> includes debt.			

4.5 Mandated Benefits

To date, markets have been unable to encourage insurance provision, effectively and competitively priced. In this context, employers are the ones required by law to provide specific benefits to workers such as social insurance benefits (i.e. unemployment, pensions, health care, worker compensation), bonuses and vacation pay, as well as mandated family leave for birth, parenting, and caregiving. The historical rationale for benefits mandated by governments includes the existence of positive externalities for society from such investments (for example, very obviously for health care); and the lack of capacity to optimally plan inter-temporally of individuals.

New forms of work arrangements are challenging the provision of mandated benefits. Platform work and flexible work options create a new set of issues to consider when designing such benefits as these workers are naturally excluded from standard arrangements given the non-full-time nature of their work contracts. Moreover, there exists important demographic diversity across platform workers further challenging the design of mandated benefit packages, since these diverse workers have diverse preferences with regard to specific mandated benefits (as it is shown by [Gruber, 2022](#), for US Uber workers).

We review first the evidence on unemployment insurance and pensions, and then that on paid family leave. None of the papers considered for this review study the labor market effects of bonuses and/or paid vacation. Approximately 72 countries worldwide, including all OECD countries, have some form of unemployment insurance (UI, henceforth) designed to financially support unemployed individuals while they search for a job. Although programs differ across countries, most UI systems exhibit a similar structure that determines eligibility, coverage, and generosity of benefits (see [Schmieder and Von Wachter, 2016](#), from whom this introductory section on UI draws heavily on).²⁵

Unemployment (and pension insurance) can be organized around two types of (extreme) conceptual frameworks. On the one hand, there is the *pay-as-you-go system*, which involves risk-pooling arrangements financed on a pay-as-you-go basis. In this system, workers and employers contribute to a fund that then pays benefits to those who become unemployed (or eligible for a pension). Contributions do not adjust for individual risk profiles, involving considerable implicit and systematic income risk and redistribution: some individuals contribute more than they take out (taxing their contributions or "savings"), while others contribute less (receiving a subsidy). On the other hand, there is the *individual account system*, which can include 'notional' individualized accounting of statutory contributions, in which in practice workers self-insure based on their contributions and those of their employer. Contributions are directly linked to benefits without transfers between plan members. Usually, this can be transferred to pensions if unused. An element of solidarity might be introduced to increase or prolong the benefits of vulnerable workers.

In practice, actual systems are more a mix of the pay-as-you-go and individual-account extremes. The typical UI system is a mandatory insurance system run at the national or state level that covers all salaried workers in the formal sector, with some variation in the coverage of public employees and

²⁵ [Asenjo and Pignatti \(2019\)](#) study the differences in UI systems across advanced and emerging economies in their relative reliance on UI or severance payments, financing, entitlement conditions, generosity, job search requirements, and job refusal sanctions.

the self-employed.²⁶ UI eligibility of an individual entering unemployment is typically determined by two types of criteria: (a) certain minimal employment history requirements and (b) the reason for being unemployed.²⁷ UI is typically financed through employer contributions and payroll taxes paid by workers. In many countries, the government supplements the UI funds from general tax revenue either regularly or during times of economic downturns. The contribution rates, as a percentage of gross earnings are often split evenly between workers and employers. The duration of unemployment benefits varies significantly across and within countries. Within countries, the duration is often a function of the duration of past contributions and sometimes varies with the age of the unemployed. In some countries, it also varies with the business cycle (the duration increases during periods of high unemployment). The level of unemployment benefits is calculated as a replacement rate of pre-unemployment earnings, subject to a maximum level. Most countries feature replacement rates between 50% and 65%, though some are significantly more generous. Although the majority of countries pay a constant benefit level, some UI systems feature a declining benefit path.

When it comes to pensions, a majority of countries in the world have some form of pension insurance system in place to guarantee that once individuals reach a certain age (and potentially are no longer able to work) they still have a secure form of income by which they can secure at least some basic living standards. It is customary for governments to provide a universal minimum or means-tested pension to those who do not have the right to other pension forms, and ensure the (public or private) provision of a pension system for those who do (being a pay-as-you-go system, an individual account system, or a mix of these two). There are differences in the legal retirement age across countries (this is the one policy variable that affects the duration of the pension), but the tendency is for governments to rise the retirement age to guarantee the sustainability of the system following population aging.²⁸ The replacement rates (relative to pre-retirement income) also differ across countries; however, the most important differences in replacement rates tend to be within countries and across different types of workers (being higher for those with lower pre-retirement incomes).

Family leave policies differ in terms of duration, ranging from a few weeks to years; replacement rates, ranging from 0% (it can be unpaid) to 100%; and in whether they allow leave to be transferable between the two main caregivers.

4.5.1 Unemployment Insurance: Impact on Living Standards

The impact of the unemployment insurance on employment: Unemployment insurance has long been believed to help individuals find better jobs, but also thought to disincentivize job search and thus lead to lower levels of employment. The evidence is mixed. Some studies have found

²⁶Two interesting exceptions are Denmark and Finland, where UI is a voluntary program subsidized by the government. Another interesting example is Chile, where individual benefits are drawn from individual UI savings accounts supplemented by a traditional insurance component.

²⁷Recipients of UI are oftentimes required to be actively involved in labor market search. Some UI systems are combined with active labor market programs. Some countries permit UI recipients to work part-time while continuing to receive partial or full benefits. These provisions are often viewed as a way to reduce the disincentive effect of UI and to encourage workers to take on part-time work as a stepping stone toward full-time employment.

²⁸The ongoing discussion on the pension system is marked by the demographic challenge following the aging of the populations and the need of a reform (see Góra, 2014, for reference). This is particularly true for developed countries but also for emerging economies.

evidence that UI access has a positive effect on employment (Doornik et al., 2022; Cirelli et al., 2021). Yet both a longer duration and a greater benefits level seem to be associated with negative employment effects in the US and Europe (Schmieder and Von Wachter, 2016; Garin et al., 2023) while having no effects on unemployment in Mexico (Cirelli et al., 2021).

Doornik et al. (2022) find a positive correlation between UI coverage and employment by comparing workers who, following a 2015 reform in the Brazilian system, saw their UI access tightened to others who worked at the same firm and did not. Affected workers saw their employment levels drop by 2.2% compared to non-affected workers, and hiring also declined. Moreover, not all firms' employment (hiring and separations) was affected by the same magnitude. There were important differences by how risky the firm was—risk was proxied by layoff intensity and credit risk—showing that the employment decline was the smallest in the lowest risk decile, and the magnitude of the decline increased the riskier the firm. The employment decline ranged from 0.6%–1% for the less risky firms and it was 24–48 basis points stronger per risk decile. In favor of the theory that tightened access to UI pushed workers to reallocate from risky to safer firms, the authors present evidence that affected workers became more likely to reallocate from riskier to safer firms after the reform compared to non-affected workers.

In a study with a very different methodology—a counterfactual exercise on a structural model calibrated for 2017 Mexico—Cirelli et al. (2021) uncover a qualitatively equivalent effect. The authors find a negative effect of UI on unemployment, specifically, that introducing a UI savings account system with *contributions made by the government* (financed via payroll taxes) could reduce unemployment (and raise welfare), relative to a system where individuals rely on severance payments in between job spells granted independently of their job tenure history. By construction, the UI system's overall tax revenue and expenditure is equivalent to that of the current system with severance payments, and both budgets are balanced. On one hand, personalized accounts incentivize (formal) work. On the other hand, a dependent payments history incentivizes individuals to search for and maintain (formal) jobs. The insights of this work might not only be relevant for Mexico but also for other middle-income economies with large informal sectors lacking UI.

When it comes to the evidence on the specific UI policy tools, though, the research available points in another direction. Schmieder and Von Wachter (2016) review the literature by revisiting the evidence from the 2000s–early 2010s to confirm the older literature's finding of a negative employment effect of both duration and level of unemployment insurance. The authors show, across different studies, that increases in the duration of the benefits are found to have precisely estimated and modest negative employment effects for both the US and Europe. For Europe, the median of estimated marginal effects is 0.13, meaning that for 1 month increase in UI benefits duration, the non-employment duration rises by approximately 4 days. For the US the number of studies for which duration elasticities are available is more limited, but those are in a similar range as estimates from Europe.

Changes in the benefit levels are also positively associated with the length of unemployment/non-employment. The elasticities with respect to UI benefit levels range from 0.1 to 2 with a median of 0.53, and are greater than the elasticities with respect to the benefit duration.

This might be linked to the fact that responses to benefit changes are more evenly distributed across the length of the unemployment spell, compared to the response to changes on duration (the effect of which is mitigated by discounting and which only affects workers exhausting benefits). However, in a counterfactual exercise [Cirelli et al. \(2021\)](#) find that benefit level changes—specifically, a reduction of the replacement rate—would have no effect on unemployment (compared to a hypothetical scenario where the optimal UI system is in place), but would otherwise decrease formal employment by a small amount with small negative welfare effects overall. The authors also find that rising contributions (indirectly financed by payroll taxes) would increase unemployment and reduce formality with important negative welfare effects (compared to the optimal UI scheme proposed by the authors).

In the specific case of digital platform workers in the United States, [Garin et al. \(2023\)](#) find the expansion of UI benefits in the Covid-19 pandemic appears to have decreased these workers' labor supply. They report a decrease in tax-reported self-employment profits of 22 cents per every dollar increase in UI among platform workers.

The impact of the unemployment insurance on wages and labor earnings: The evidence on wages is also mixed. While [Landais et al. \(2018\)](#) find no effect of UI on wages in the literature (reviewing studies of the US and Austria), [Doornik et al. \(2022\)](#) find that UI has a negative effect on wages, as well as evidence that layoff risk is priced into the wage workers received. In the absence of UI, the compensating differential that workers demand from firms for the layoff risk is greater. Specifically, the authors find that following 2015 system reform in Brazil that tightened UI coverage, wages of affected workers increased: by 0.5% for workers whose eligibility criteria tightened relative to those unaffected by the reform. Similarly, hiring wages increase by 1.3% relative to workers unaffected by the reform. Comparing wage changes for risky and safe firms, the authors find a relative increase in wages by 0.15–0.29 percentage points per risk decile (as proxied by layoff intensity or credit risk).

What can reconcile employment and wage effects in the different studies? The exact policy that might be playing a role—we might expect access and an extension of the duration or an increase of the benefits to have different effects—and, moreover, there are structural differences both across studies and between developed and LMICs.²⁹

To summarize key points, first is whether the work estimates micro or macro elasticities. All the effects in [Schmieder and Von Wachter \(2016\)](#) refer to micro elasticities which omit the effects of these policies on labor market tightness, arising as a consequence of the individuals' employment response to the policy. The effect of UI on labor market tightness is accounted for by the first two studies who estimate macro elasticities ([Doornik et al., 2022](#); [Cirelli et al., 2021](#)). Reviewing the recent literature, [Landais et al. \(2018\)](#) find evidence that the macro elasticity is smaller than the micro elasticity—in other words, that UI increases labor market tightness (i.e. the number of

²⁹[Robalino \(2014\)](#) argues that the specific scheme used does not play a role, at least in LMICs. The author claims that neither a pay-as-you-go nor an individual savings account scheme is inherently more efficient and that the policy choices that matter are the benefits level (to all workers, including those that do not have enough contributions to qualify for UI) and the resources needed to finance the system (savings tax, payroll tax, consumption tax, etc.). Taxing savings or wages are two options that could be combined with other options such as consumption taxes (likely reaching a better balance between worker protection and incentives to work).

unemployed per vacancy).³⁰ However, even if macro elasticities are found to be smaller than micro ones, which might reduce the distance in the results across studies and account for the different findings of the changes in the level of benefits on employment, that does not help to explain the different qualitative effects found for employment across low and high income countries.

Second, there might be differences in measurement. To give an example, the definition of unemployment duration differs between Europe and the US: in Europe it refers to the duration between jobs; in the US, to the duration of unemployment or UI benefits. One might expect differences in measurement to be at least as salient between high (the US, Europe, and Austria) and middle income countries (Brazil and Mexico) for which we have evidence.

Third, risk aversion might be greater in LMICs and access to self-insurance (savings, credit cards, etc.) more limited, and both facts might explain higher sensitivity to changes in UI policy. This could explain the different effects of UI found on wages.

Fourth, Brazil has a higher replacement rate of UI benefits (and a shorter duration than other countries), which might make workers affected more sensitive to losing those benefits (Doornik et al., 2022). This is also true for Cirelli et al. (2021), a study focusing on Mexico where the replacement rate of the proposed unemployment insurance system is 100%.

Fifth, there are differences in the availability of social insurance support after UI exhaustion across different countries that might be playing a role.

Sixth, a key difference might be that the informal sector acts like a buffer in LMICs (an option that is not as readily available in developed countries). One might easily see that following the tightening of UI coverage, affected workers can potentially work in the informal sector (for a likely higher effective salary) and for this reason, formal employment might be more sensitive to UI changes in LMICs. The tightening in UI coverage decreases the costs of informal work for affected workers, making the option of informal work more attractive all else equal; instead, the introduction of a UI savings account scheme with contributions made by the government makes informal work much less attractive and thus might increase formal employment.

Seventh, Doornik et al. (2022) mention that for most of the sample period Brazil experienced a severe recession while workers are more sensitive to UI coverage in downturns than in booms since the likelihood of a layoff is higher, which might be partially driving the results. However, this was not the case for Mexico in 2017. The welfare effects of an increase in UI benefits are shown to vary over the business cycle though, i.e. the welfare effect of rising UI benefits is greater in a recession. This has been shown by Kroft and Notowidigdo (2016) who find by exploiting variation across US local labor markets that the marginal welfare gains from increasing the unemployment insurance benefit vary over the business cycle. The authors interpret the UI benefit as being composed of a moral hazard cost and a consumption smoothing benefit. While the moral hazard cost is found to be procyclical (greater when the unemployment rate is relatively low), there is no evidence that the

³⁰Landais et al. (2018) present further evidence from recent literature that labor market tightening increases via the ‘rat-race channel’, or the fact that the presence of job seekers who search intensely hurts the prospects of other job seekers in the job market. There is no evidence in the recent literature of a job-creation channel (or the fact that a UI extension does lead to an increased number of vacancies). This conclusion is reached as there are no effects of UI on wages found in the recent literature.

consumption smoothing benefit varies with the unemployment rate. Using these empirical results, the authors estimate the welfare gain and find that it is modest on average but varies positively with the unemployment rate.

However, in the context of recessions, having UI as a unique policy tool to rely on might lead to a non-optimally high level of layoffs and might destroy optimal employment matches. This argument has been particularly relevant in the context of the Covid-19 pandemic, when the US, Europe, and the UK adopted very different policies: the US protected workers via the extension/increase of UI benefits while Europe and the UK protected jobs (Giupponi et al., 2022). Since these policies protect against different risks, they have different effects and should be seen as complementary. Both policies also offer fiscal complementarities.

4.5.2 Unemployment Insurance: Impact on Productivity

There are several channels by which UI is found to (positively) impact productivity. First, a more generous UI system reallocates labor toward riskier firms—risk being proxied by layoff intensity or credit risk—which tend to be more innovative and productive (Doornik et al., 2022), increasing overall labor productivity. Second, a more generous UI system incentivizes entrepreneurship by reducing labor costs. Entrepreneurs tend to be more innovative and productive (Doornik et al., 2022). Via this channel, UI can affect aggregate productivity. Third, more generous UI reduces informality, leading to higher productivity. There is evidence of workers reallocating from the informal to the formal sector following the introduction of an UI savings account scheme (relative to a severance payment system), as well as of increases in output per worker (Cirelli et al., 2021). Fourth, a more generous UI system increases human capital formation by facilitating investments in skills (Barr and Turner, 2015). However, relying only on UI schemes during recessions (without complementary policies such as furlough schemes) might have negative productivity implications. Relying on UI schemes during recessions only might lead to the destruction of profitable and productive matches (above what would be optimal) and thus might have a negative impact on productivity. It might be a good idea to also protect jobs (Giupponi et al., 2022).

4.5.3 Unemployment Insurance: Impact on Social Cohesion

Recent research has also found that UI can mitigate crime. Britto et al. (2022) leverage detailed individual-level data to study the impact of job loss on crime among males, as well as the mitigating effects of unemployment benefits, and find joblessness increases the probability of committing crimes. The authors employ a regression discontinuity design around the threshold for unemployment benefit eligibility, and show this benefit “completely offsets potential crime increases upon job loss”. This mitigating effect, however, disappears after the benefit expires.

4.5.4 Pension System: Impact on Living Standards

When it comes to the effect of a pension scheme on living standards, and unlike for UI, there is evidence the type of scheme—i.e. a pay-as-you-go or an individual savings account system—matters

(McKiernan, 2021; French et al., 2022).

Individual savings account systems seem to be associated with increased *aggregate* welfare but slightly worse *aggregate* employment outcomes than pay-as-you-go pension schemes. Specifically, McKiernan (2021) show that the 1981 privatization of the Chilean social security system—which changed the pay-as-you-go system for an individual savings account scheme—led to large aggregate long-run welfare gains. However, the authors found welfare losses for two groups: retired manual laborers at the time of the reform and white-collar workers within 5 years of retirement at the time of the reform. French et al. (2022) exploit a Polish pension system change affecting those born after 1948—from a defined benefit (the pay-as-you-go system is an unfunded defined benefit scheme) to a notional defined contribution scheme (i.e. a *notional* individual savings account system)—to show that the switch led to an employment increase among the young individuals (those in their 30s) but to a decrease of employment for those at older ages. This reduced overall labor supply across the life-cycle by 2 months. The findings arise from a life-cycle model that replicates the employment elasticity with respect to the return to work of 0.44 for ages 51–54 estimated by the authors using the universe of taxpayers and the sharp cohort-based discontinuity in the link between current contributions and future benefits.

The pension system interacts with the level of informality. The informality margin is a quantitatively important channel that should be considered in reform analyses since it might alter the policy needs. McKiernan (2021) finds that the existence of informality decreases the long-run welfare gains from privatizing Social Security. Moreno (2022) shows that contributory pension systems in economies with large informal sectors (both pay-as-you-go or individual accounts) have important impacts on the decision to work in the formal sector and that removing them can increase welfare in a context where a non-contributory means-tested system for those uncovered is also available.

When it comes to the effects of specific policy tools, the evidence shows considerable differences across them. Tkhir (2021) shows in a set of counterfactual policy exercises performed on a general equilibrium model in Brazil that a number of separate policies satisfy the long-term fiscal goal of compensating for the effect of demographic change: increasing the payroll taxes, reducing the replacement rate, raising the required years of contribution, and increasing the retirement age. The increase in the payroll tax (from 11% to 34%) increases the share of informal workers by 39 percentage points (compared to the case of no reform), leading to the largest welfare loss of 17.5% compared to the alternatives. The decrease in the replacement rate from 70% to 60% instead increases long-run welfare by rising formal wages and the share of formal workers by 4 percentage points. In the long run, the reform increases lifetime welfare by 3.6%. The increase in the required years of contribution from 15 to 40, increases formal wages and reduces the share of informal workers by 7.6 percentage points, leading to a long-term welfare gain of 6.7%. The rise in the retirement age by 5 years slightly reduces the share of informal workers (0.4 percentage points) while having no major effect on wages; leading to a 7% welfare gain. Furthermore, there is evidence that raising the retirement age not only increases the employment level of workers close to retirement age but also of younger workers. Carta et al. (2021) quantify the effects of a policy-induced sharp increase in retirement ages on workers of different ages using Italian matched employer-employee data.

The actual 2019 reform of the Brazilian pension system, which corrected the fiscal deficit induced by the demographic change, by reducing the replacement rate (from 70% to 60%), increasing the required years of contribution (from 15 to 20 years) and raising the retirement age (from 60 to 65 years) led to a drop in informality of 4 percentage points and an increase in welfare.

The economic effect of specific pension policy tools also interacts with the level of informality. Abstracting from an extensive margin of labor adjustments may lead to wrong conclusions about the magnitude and the direction of necessary fiscal interventions (Tkhir, 2021). In the absence of informality: (1) the government could have reached the long-term sustainability goal at a much lower tax rate, without severe economic repercussions; (2) the reallocation of workers from the informal to the formal sector—arising after the reduction of the replacement rate and the increase of the required years—amplified the positive effects of these reforms; (3) informality does not seem to play a big role in the context of the retirement age increase.

There is also evidence that the extent of the lag between the announcement and the implementation of structural pension reforms matters for employment. Bi and Zubairy (2021) show across 10 OECD countries that prolonged phase-in periods lead to employment reductions of those close to retirement. The longer the lag, the stronger the decline in labor force participation rates, if fundamental policy changes are introduced and for citizens who might have lower trust in the government.

4.5.5 Pension System: Impact on Productivity

The specificities of the pension system have implications for productivity, first, since they affect the levels of formal work, with greater levels of formal work positively associated with the level of productivity; and second, since pension systems (dis)incentivize savings and capital accumulation.

Tkhir (2021) shows that the actual 2019 Brazil pension system reform—which reduced the replacement rate, increased the required years of contribution and raised the retirement age—led to a drop in the share of informal workers as well as to an increase in capital accumulation, both with likely positive productive effects. Reforms involving rises in payroll taxes, increase informal work and disincentivize capital accumulation, likely leading to negative effects on productivity. Reforms involving a reduction in the replacement rate or a rise in the required years of contribution or an increase in the retirement age, reduce informal employment and stimulate capital accumulation with likely positive effects on productivity.

Carta et al. (2021) show another mechanism through which raising the retirement age might increase productivity, i.e. maintaining productive older workers at work. The authors exploit a policy-induced sharp increase in retirement ages on workers of different ages using Italian matched employer-employee data to find that an increase in employment of older workers (as a consequence of the reform) leads to a precisely estimated rise in value-added. The findings suggest rising institutional retirement ages can help firms to retain valuable older employees.

4.5.6 Paid Family Leave: Impact on Living Standards

The evidence reviewed on paid family leave shows, on one hand, that prolonged absences from the labor market might reduce labor market attachment; and on the other, that allowing workers to take time off a job (they can come back to) when they need it might reduce turnover and have beneficial effects both in terms of wages as well as employment levels.

The impact of paid family leave on employment: In a cross-country comparison, more generous family-friendly policies have been shown to lead to increased women’s employment, but they might do so via more part-time work and reduced access to high-level positions (Blau and Kahn, 2013).

However, more recent evidence for the United States, using more complex research designs and micro-data shows conflicting views. On the one hand, Byker (2016) finds that after the introduction of paid parental leave in California and New Jersey, women who otherwise would have exited the labor force temporarily in the months around a birth experienced an increase in labor force attachment, making them more inclined to continue participating in the labor force. On the other, Bailey et al. (2019) use administrative data to study the effects of California’s new paid leave on women’s careers and find no effects in the short run on women’s employment, earnings, or attachment to employers—but negative effects in the long run on employment and wages.

Rossin-Slater (2017) reviews the recent literature on maternity and family leave policies, not only in the US but also around the world, and finds are positive long-run effects on women’s employment outcomes in terms of job continuity and employment rates of less than 1-year-long leave; but that longer leaves can negatively affect women’s earnings, employment, and career advancement. Similarly, Schönberg and Ludsteck (2014), exploit Germany’s 5 major maternity leave expansions to find a very small negative effect on new mothers’ employment in the long run, despite finding very strong short-term negative effects.

For LMICs, there is not much existing evidence. UNICEF (2019) presents stylized facts on the coverage and discuss the (likely) effects of paid family leave in a discursive manner. The study shows that millions of working women worldwide are not covered by paid parental leave and that the situation is even worse for parents. (Two-thirds of the world’s children under 1 year old live in countries where fathers are not covered by regulations.) The study also mentions that in low- and middle-income countries, paid maternity leave has positive effects on labor force participation.

There is also evidence of the effects of family leave on the coworkers of the worker taking the leave. This evidence shows there is no negative effect on their employment outcomes. Brenøe et al. (2020) provide evidence that in Denmark coworkers of a woman going on leave see temporary increases in their hours, earnings, and likelihood of being employed.

4.5.7 Paid Family Leave: Impact on Productivity

Paid family leave allows for time off when needed by families, which might help preserve productive labor matches. While more research is needed, the current evidence shows minimal impacts of

existing US state-level programs on productivity. More specifically on employee productivity, profitability, turnover rates, or the total wage bill (Rossin-Slater, 2017).

UNICEF (2019) discuss the potential effects of paid family leave in LMICs, mentioning benefits to employers through lower turnover, lower recruitment and training costs, and retention of the higher productivity of experienced employees.

Brenøe et al. (2020) study specifically the costs and effects of family leave policies on firms in Denmark, specifically estimating the effect of a female employee giving birth and taking parental leave on a small firms. Using a dynamic difference-in-differences design, and comparing small firms in which a female employee is about to give birth to an equivalent sample of small firms (in terms of characteristics) with female employees who are not close to giving birth, they find little evidence that parental leave take-up has negative effects on firms overall. After accounting for wage reimbursements received by firms offering paid leave, there are no measurable effects on firm output, labor costs, profitability or survival. This is because firms compensate with existing employees for the absent worker. However, the authors find evidence that parental leave has negative effects on a small subsample of firms that are less able to use their existing employees to compensate for an absent worker. In other words, there is evidence that paid family leave enlarges further the productivity gap across the least and most productive.

The impacts of mandated benefits on living standards and productivity are summarized in Table 6.

5 Interaction between PMR and LMR

Reforms of existing market regulations are rarely enforced in isolation, but often in “reform packages” (Nicoletti and Scarpetta, 2005). A small literature documents how PMR and LMR can interact in non-trivial ways and how pre-existing regulatory conditions mediate the effects of policy reforms on output, prices, and employment. Understanding these complex relationships is crucial to designing effective reforms. This section reviews the existing evidence.

In their early empirical paper, Nicoletti and Scarpetta (2005) show that the effects of PMR depend on existing LMR. They provide evidence that anti-competitive PMR reforms are more likely to reduce overall employment levels when labor market policies or institutions provide workers relatively high bargaining powers. According to the authors, PMR and LMR can be considered political complements. A key mechanism behind the interaction of PMR and LMR is their respective impact on the rents earned by firms and workers. Highly centralized bargaining agreements (as an example of worker-friendly labor market institutions) or high unemployment benefits (as an example of worker-friendly labor market policy) allow workers to capture more of the firms’ rents when negotiating over wages. This incentivizes them to support product market structures that enable the creation of rents in the first place, as well as LMR that strengthen their bargaining power.

Using different methods but comparable data, Griffith et al. (2007) analyze labor market reactions to changes in firms’ profitability, instrumented by PMR. They find heterogeneous effects of

Table 6: Impacts of mandated benefits on living standards, productivity, and social cohesion

Indicator	Findings	Range of estimates	Details
<i>Living standards</i>			
Employment	Mixed evidence		<i>Unemployment Insurance (UI)</i> : less negative employment effects for developing countries. <i>Pension</i> : the different policy tools have different (both positive and negative) effects on the level of (formal) employment. <i>Paid family leave</i> : long-run employment effect is contested with some studies finding positive estimates; while others negative ones. <i>Pension</i> : rising the retirement age raises LFPR of younger workers.
Employment (particular groups)	Increases		
Labor earnings	Mixed evidence		<i>UI</i> : no effect in the US and Austria, negative effect in Brazil. <i>Pension</i> : the different policy tools have different (both positive and negative) effects on the (formal) wage.
<i>Productivity</i>			
Productivity	Increases		<i>UI</i> : positive effect (entrepreneurship). <i>Pension</i> : rise in payroll tax negative effect on productivity; reduction in the replacement rate, rise in the required years of contribution or increase in the retirement age positive effect on productivity. <i>Paid family leave</i> : positive effect (lower turnover, labor productivity).
Labor reallocation	Increases		<i>UI</i> : reallocates workers towards more risky firms (more innovative).
Physical and human capital	Increases		<i>UI</i> : facilitates investment in skills.
<i>Social cohesion</i>			
Social cohesion	No evidence		

Notes: The category *Labor earnings (particular groups)*, *labor earnings inequality* includes both earnings inequality and effects on specific groups. The category *Prices* includes debt.

deregulatory product market reforms dependent on the labor market regulations in place. They proxy workers' bargaining power with the share of workers whose wages are determined by union agreements, regardless of whether they belong to a union ("bargaining coverage"). When workers' bargaining power is high, increased competition reduces unemployment more than when it is low. For example, when firm profitability drops by 3 percentage points, unemployment is estimated to decrease by only 0.6 percentage points in economies with low bargaining power (a coverage of 53%, for example), while it decreases by 1.1 percentage points in high bargaining power (97% coverage) settings.³¹ This is in line with [Nicoletti and Scarpetta \(2005\)](#), who find that the positive employment effects of deregulating product markets are larger when labor markets are more restrictive. Interestingly, real wages increase less after the increased competition when bargaining power is high than when it is low.

Again, based on OECD data, [Bassanini and Duval \(2009\)](#) estimate reduced-form unemployment equations consistent with standard job-search and wage-setting models. In the average sample country, less stringent PMR is consistently associated with decreases in aggregate unemployment. However, the results are not consistent across countries when analyzing interaction between individual pairs of policies and accounting for their endogeneity. The authors argue the entire regulatory framework (not always just a pair of two policies) is the more relevant dimension to consider when evaluating the effectiveness of a policy given its context.

They proceed to construct a measure capturing how 'employment-friendly' the overall regulatory framework is within individual countries. The measure consists of the sum of the linear unemployment effects of individual regulations. In subsequent regressions, this measure is interacted with each individual regulation. The results show consistently that there are reinforcing effects between the individual policies and the overall regulatory framework: any reform that reduces regulations which are detrimental to employment (for example, anti-competitive PMR), would have a larger impact the more employment-friendly the overall policy stance. This stands in some contrast to other findings from the literature, albeit the framework implemented by [Bassanini and Duval \(2009\)](#) is difficult to compare to those in other studies. In addition, the authors find some evidence between reform complementarities: two employment-enhancing reforms can have larger impacts when implemented simultaneously.

[Aghion et al. \(2008\)](#) analyze an episode of liberalization in the manufacturing sector in India that began in the 1980s. Their unique setting allows for investigating the effects of delicensing individual industries under varying labor market regimes, as the reforms occurred at the level of individual manufacturing industries, while labor market regulations were put in place regionally. In general, delicensing led to statistically significant increases in the number of factories of around 6%, but no significant increase in real output. In their main model specification, the authors find that the effect of delicensing on both the number of firms and firm productivity is significantly more negative when labor market regulations are historically more employer-friendly. This key result also holds when implementing an instrumental variable specification that tackles remaining endogeneity concerns

³¹For comparison, initial coverage was relatively low in Canada or the UK, with 39% and 64%, respectively, and relatively high in Austria with 99%. As a robustness check, the authors proxy workers' bargaining power with the share of workers who are members of a union. The estimated effect is much smaller but qualitatively consistent.

with respect to labor market regulations. Finally, the authors also document that pro-worker states experience significantly less employment growth and investment relative to pro-employer states following delicensing.

Another episode of liberalization—China’s state-owned enterprises reforms of the late 1990s and early 2000s, which led to massive layoffs—allows an investigation into the effects of an extreme case of employment protection flexibilization. [Zhao \(2023\)](#) finds these reforms, which allowed Chinese firms to dismiss redundant workers and those with previously permanent positions, had an effect on labor market equilibria. Specifically, workers without a high school degree faced worse employment prospects after the reform and were incentivized to upgrade their skills and complete high school. The findings suggest distortionary government interference can have negative effects on workers’ skill acquisition incentives: state-owned enterprises that guarantee lifelong jobs and welfare might discourage workers to upgrade their skills and accumulate human capital, leaving them vulnerable to flexibilization shocks.

[Dustmann et al. \(2014\)](#) analyze the German deregulation of wage-setting processes in an environment characterized by high worker protection. Historically, these processes were considered a matter of negotiation between firms and workers. While, by European comparison, firms always had the opportunity to opt out of collective bargaining agreements relatively easily, in the 1990s, the processes were decentralized even further from the industry to the firm level. On the one hand, the share of workers covered by union agreements decreased sharply, and, on the other, the role of firm-based works councils in wage determination was strengthened relative to trade unions. The authors carefully develop the argument that this regulatory structure on German labor markets gave the country the necessary flexibility to overcome the Great Financial Crisis relatively well. They recommend reforms to other European economies that target the system of industrial relations by decentralizing bargaining to the firm level while keeping workers’ representatives involved to ensure that employees benefit again when economic conditions improve. However, they acknowledge that such reforms are politically difficult to implement and succeeded in Germany only due to its unique situation following the reunification in 1989.

A related, more theoretical literature complements the empirical studies by formalizing the mechanisms through which PMR and LMR interact. They can be a helpful starting point for creating reform packages that enhance labor market outcomes in the long run without causing too many negative short-run effects or hurting vulnerable groups.

In the early work of [Blanchard and Giavazzi \(2003\)](#), product markets operate under monopolistic competition, and regulations are modeled as firm entry costs. At the same time, workers’ bargaining power captures the degree of LMR. In the baseline model, employment and wages are determined simultaneously through so-called “efficient bargaining.” In the presence of rents, this assumption allows the workers to demand higher wages without necessarily accepting lower employment levels. In the model, product market deregulation leads to an increase in real wages and a decrease in unemployment both in the short and long run.³²

³²In an extension, the authors compare the outcomes under “efficient bargaining” to those obtained under the so-called “right to manage model,” in which firms decide on employment level after determining wages in a bargaining process. This results in lower unemployment levels given fixed entry costs but does not qualitatively change the effects of product

In this model, product market and LMR are considered “political complements.” The intuition behind this result is that more regulated product markets tend to generate rents, which are then shared amongst the firm owners and the employees. To the extent that LMR affect workers’ bargaining power over these rents, stronger labor market regulation will increase the share of the rent attributed to workers. This implies that stronger labor market regulation will also increase workers’ interest in maintaining rents high by avoiding product market deregulation. Put differently, the less regulated the labor markets, the easier it will be to enact product market deregulation – hence the term political complements. The authors note that for practical policy purposes, reforms to both types of regulations should be considered jointly.

Following the seminal work of [Blanchard and Giavazzi \(2003\)](#), further papers have been written on this interaction, often highlighting the critical role of wage-setting processes in the propagation of product market reforms. [Spector \(2004\)](#) presents a model that emphasizes the interaction between imperfect competition in product markets and bargaining in the labor market. The production relies on capital as well as labor inputs and features decreasing returns to labor. Product market regulations are modeled in the form of a constraint on the number of varieties in the economy. Due to symmetry across firms, this is equivalent to a restriction on the number of product varieties each firm can sell. In the short run, the number of firms is fixed and exogenous, but in the long run, firms’ profits are kept constant by international capital flows, thereby causing adjustments to the number of firms.

The paper analyzes the impact of changes in PMR under two alternative bargaining schemes. The first is “efficient bargaining” over real wages and employment. In contrast, the second is a “right to manage” framework, where firms decide on employment levels after agreeing on a wage level. The second option leads to the wage rate being kept below the marginal product of labor, while in the first, the wage rate can even lie above the latter. In both cases, workers’ reservation wage is a function of the aggregate employment rate. The shape of this function is meant to capture how elastic unemployment benefits are relative to economic conditions, thus indicating the extent of the welfare state.

In the short term, increased product market competition causes employment, aggregate welfare, and the share of labor in production to rise. Whether the real wages rise or fall depends on the relative importance of the welfare state in the economy and the bargaining power of workers, independent of the bargaining process (“efficient bargaining” versus “right to manage” framework). In general, under low levels of LMR (i.e., when workers have low bargaining power and enjoy low unemployment benefits), decreases in PMR should cause wages to rise in the short run. In this sense, product, and labor market deregulation are again “political complements,” as in [Blanchard and Giavazzi \(2003\)](#).

In the long term, increased product market competition leads to lower unemployment under both types of bargaining processes. However, how the real wage adapts depends on whether it initially lies above or below its marginal revenue product. Under the “right to manage framework,” where wage rates are initially below the marginal product of labor, real wages rise. Under efficient bargaining, the high bargaining power of workers can lead to initial wage rates above the marginal market deregulation.

product of labor. If that is the case, increased product market competition can lead to real wages falling even in the long run. Put differently, under efficient bargaining, real wages only increase when workers' bargaining power is sufficiently low.

In a related paper, [Ebell and Haefke \(2009\)](#) build a dynamic structural model with monopolistic competition, multi-worker firms, and Mortensen-Pissarides-style matching frictions. Product market regulations take the form of firm entry costs and determine the degree of competition that arises. As competition increases, firms expand their production and hence experience an increased demand for labor. In addition, there is an over-hiring effect, which arises due to the interplay of imperfect competition and individual bargaining in multi-worker firms.

They perform calibrated model experiments to see whether the Carter/Reagan deregulation of the late 1970s and early 1980s can account for the subsequent decline in US unemployment during the 1980s and 1990s. Their answer depends starkly on the surplus calibration and, in particular, on the semi-elasticity of unemployment with respect to benefits. Under standard calibration, where the implied semi-elasticity is equal to 2, the effect of deregulation is minimal. However, it explains the entire decline in unemployment when these semi-elasticities are high (equal to 14).

The empirical paper by [Griffith et al. \(2007\)](#) mentioned above also includes a short theoretical section, which is used to discuss the interactions of product regulations and labor market regulations and how these matter for employment and wages. When PMR is changed to achieve a higher level of competition, the positive effect on employment is greater when LMR are stronger. In the model, this corresponds to having an "efficient bargaining" process established, in which firms and unions bargain jointly over employment and wages. During negotiations, unions' wage demands are always constrained by the level of competition in the product market. Therefore, an increase in competition in an economy will lead to greater reductions in prices and greater increases in output than in an economy without unions. Employment will increase more, but nominal wages increase less than in a less unionized economy.³³

Focusing on LMICs, [Charlot et al. \(2015\)](#) propose a model that includes informality as a key feature of many LMICs. The formal and informal sectors adhere to the same baseline structure of monopolistic competition and are subject to frictions when searching for workers. Both types of firms recruit workers from the same labor market. However, the informal, low-productivity sector features lower initial entry costs, does not pay taxes, and is not subject to collective bargaining. In addition, after calibrating the model to a typical low-income country, the matching process features fewer frictions than that of the formal sector.

Product market deregulation is simulated by reducing the entry costs for formal sector firms. It simultaneously leads to more competition in the formal sector, decreases unemployment and informality, and reduces economy-wide wage inequality. Numerically, a fall in formal sector entry costs that reduces informality by 1% decreases unemployment by 0.26% under individual bargaining. In contrast, the unemployment reduction would amount to 5.27% if there were collective bargaining in the formal sector. The reason why this reduction of unemployment is stronger under

³³Compared to the case of individual bargaining, employment is a bit lower and wages a bit higher under "efficient bargaining." The reason is that unions face the tradeoff between achieving higher employment levels or higher wages.

collective bargaining is that this type of negotiation is over the entire firm surplus. Increased levels of competition reduce formal firms' surplus, generating a stark downward pressure on wages, and large positive effects on employment. Under individual bargaining, workers capitalize on the increased labor market tightness associated with the increased competition amongst firms. Knowing that firms have higher search costs in the new, competitive environment, they are able to demand higher wages, lowering the impact of increased competition on employment.

[Meghir et al. \(2015\)](#) also present a model with informality and calibrate it to Brazil. However, they focus less on workers and bargaining processes and instead emphasize the selection of heterogeneous firms into the formal versus informal sectors. Formal firms pay taxes and social security contributions and are obliged to pay minimum wages and severance pay upon laying off workers. While informal firms are exempt from these costs, they are at risk of being fined. The fines are size-dependent, creating an incentive for informal firms to remain small. Considering this, firms decide in which sector to post vacancies and what wage to offer. Workers receive wage offers from both sectors randomly both on and off the job. A key equilibrium outcome of the model is that both formal and informal firms can coexist over a certain productivity range. This does, however, not imply that they make the same choices regarding wage offers of firm sizes: informal firms in this range of productivity pay higher wages and employ fewer workers than equally productive formal firms.

After calibrating the model to Brazil, the authors analyze how changing the fines imposed on informal firms upon detection affects informality and employment. An important finding is that this measure, while reducing informality, does not increase unemployment. Instead, it increases welfare by enabling the reallocation of workers to higher-productivity jobs. Overall, wages increase in both sectors, but whether or not wage inequality increases or decreases is unclear.

In related work on informality, [Anand and Khera \(2016\)](#) analyze the effects of product and labor market reforms on output, employment, and wages in a DSGE model. LMR are modeled as rigidities in the employer-employee matching process, while PMR take the form of firm entry costs. After calibrating the model to India, the authors show that both product and labor market deregulation increase output and employment and lower informality in the long run but have different short-run effects. Product market reforms increase output and employment even in the short run but lead to a temporary spike in the share of informal employment. In contrast, labor market reforms lower output, employment, and the relative number of formal sector firms in the short run. To overcome the short-run costs of deregulation, the authors show that a package combining both types of deregulation should be implemented. The latter helps overturn the fall in GDP and increase in unemployment associated with individual reform types.

The above papers illustrate that existing labor market regulations and policies are decisive in how strong labor market outcomes, such as employment and wages, react to changes in PMR. Some evidence points toward the wage bargaining process being a key propagator for these reactions. To the extent that LMR change these processes, for example, by altering workers' relative bargaining power or outside options, they have an important interaction with PMR through this channel. That said, the research in this area is far from conclusive and offers much room for further investigation.

Another takeaway from the literature is that product and labor market regulations often have different short- and long-run effects, which can potentially offset each other. This offers room to design reform packages in such a way that the negative short-run effects of individual policies can be alleviated. Policy makers often enact such larger policy packages, and more research on the optimal timing and order of its individual components could be beneficial to minimizing welfare losses for consumers, workers, and firms. This would, at the same time, strengthen the political support for the program.

6 Conclusion

Understanding how regulations shape labor market dynamics is crucial for developing well-targeted and inclusive policies. We distinguish between two broad types of regulations, product market regulations and labor market regulations, affecting workers either indirectly or directly. Although not exhaustive, our review of PMR and LMR covers nearly 200 papers, focusing on heterogeneous impacts across countries in different stages of development, time horizons, industries, and worker demographics.

The main part of our paper is dedicated to reviewing and summarizing how PMR and LMR matter for labor market outcomes, respectively. Both types of regulations can be useful instruments to achieve more and better jobs—a conclusion in line with the findings of the World Bank’s latest Flagship Report on Jobs (2024). Beyond providing detailed evidence on individual regulation types, we also collect evidence on how LMR and PMR interact. This evidence is useful for the design of effective policies, which should be context-specific. The review also emphasizes the need for future research on this topic, especially regarding how the ex-ante regulatory stringency on product and labor markets mediates the effects of newly introduced policies.

Throughout the review, we also note that the effects of PMR and LMR in LMICs can differ widely from the effects of the same regulations in richer countries. At the same time, there is considerably less research in lower-income settings, most likely due to a lack of reliable data. Therefore, we conclude that the availability of consistent indicators for a wide set of countries and years is particularly important to evaluate the stringency of various regulations and heterogeneous effects across prevailing market conditions. The data that the OECD provides on its member countries are an important baseline and reference.

Our study holds important implications for policy makers. In general, regulatory agencies would benefit from developing the capacity to understand how new regulations could affect workers in their countries, monitor the effects of *de facto* policy changes and key trends in real time, and adapt regulatory frameworks to changes in prevailing product and labor market conditions. Developing this capacity is as important, if not more so, than crafting the regulations themselves, yet far more effort has been expended in attempts to design and legislate an ideal regulatory framework. This capacity can provide information for governments to flexibly adapt regulations when the current constellation is not yielding the desired outcomes in the local context.

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