THE IMPACT OF IMMIGRATION ON WORKERS' PROTECTION

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LIDAM Discussion Paper IRES
2021 / 21

UCLouvain

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IRES | Louvain Institute of Data Analysis and Modeling in economics and statistics

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September 2021

Abstract

Even though the existing literature investigating the labor market impact of immigration assumes, implicitly or explicitly, that labor market regulation is exogenous to immigration (in terms of both size and composition), this is not necessarily the case. This paper shows that labor market regulation responds to the composition of the immigrant population. We build a novel workers' protection index based on 36 labor law variables over a sample of 70 developed and developing countries from 1970 to 2010. Exploiting a dynamic panel setting using both internal and external instruments, we find that workers' protection in destination countries is influenced by the degree of workers' protection that immigrants experience in their origin countries and is not affected by immigrant population size. The effects are particularly strong across two dimensions of workers' protection: worker representation laws and employment forms laws. This paper provides suggestive evidence that immigrants' participation in unions and its implications for political actors is one of the potential mechanisms. Finally, calculations based on the estimated coefficients suggest that immigration, on average, contributes to a reduction in workers' protection, particularly in OECD high-income countries.

Keywords: Migration, Labor Market Institutions, Labor Regulation, Workers' Protection.

JEL codes: J61, K31, F22.

*The authors are grateful to Kenneth Clark, Frédéric Docquier, Rosa Duarte, David Margolis, Jean-François Maystadt, Rosella Nicolini, Gianmarco Ottaviano, and Bruno Van der Linden for their useful and extensive comments. This paper has benefited from discussions at the Spring Meeting of Young Economists, Charlas de Economia (Universidad ICESI), IELM Seminar (Université Paris 1), Workshop on Labour Markets and Migration (IAAEU), Junior Migration Seminar, Workshop on Empirical and Political Economics (KULeuven), European Association of Law and Economics Conference, Labor Market Transitions: Challenges for Public Policies and Research Conference, EBES Conference, Warsaw International Economic Meeting Conference, EDP Jamboree and Doctoral Workshops (UCLouvain). Adam Levai, adam.levai@uclouvain.be, UCLouvain, Place Montesquieu, 3 - 01348 Louvain-la-Neuve, Belgium. Riccardo Turati, riccardo.turati@uab.cat, UAB, Department of Applied Economics, Edificio B2, Campus de la Universidad Autónoma de Barcelona, 08193 Bellaterra, Spain. Adam Levai acknowledges financial support from the EOS programme of the Flemish (FWO) and French-speaking (FRS-FNRS) communities of Belgium (convention 30784531 on "Winners and Losers from Globalization and Market Integration: Insights from Micro-Data". No potential competing interest was reported by the authors.

I Introduction

In recent decades, the population of international migrants has increased substantially. The most recent figures indicate that in 2019, the stock of international migrants reached 272 million globally, which accounts for 3.5% of the world's population (United Nations, 2019), whereas in the 1970s, the size of the international migrant population was around 105 million. The migrant population has changed significantly over the years, not only in size but also in composition in terms of countries of origin. In the 1970s, four developed economies—Germany, Italy, Spain, and the United Kingdom—were among the top 10 countries with the highest stock of international emigrants (Artuç et al., 2014); in 2010, however, only one developed country—the United Kingdom—had the highest stock. Other origin countries, such as Mexico and Bangladesh, now have the largest diaspora abroad (World Bank, 2010). Such a rise in the size of the international migrant population not only increased attention from local governments and international institutions, but also, thanks to the availability of novel datasets, increased the effort of the academic community to better understand the implications of immigration (Borjas, 1994, 2015). In the receiving countries, evidence shows the effect of immigration in different spheres of society, such as the welfare system (Borjas and Trejo, 1991; Borjas, 1999; Dustmann and Frattini, 2014), innovation and firms' capital adjustment (Lewis, 2011; Clemens et al., 2018; Bahar et al., 2020a), productivity (Peri, 2012), and natives' voting preferences (Halla et al., 2017; Moriconi et al., 2018; Steinmayr, 2020). A particular focus is related to the impact of immigration on natives' labor market outcomes, where the literature provides a set of mixed evidence concerning the effect of immigration on natives' wages and employment depending on the methodological approach, periods of analysis, and geographical areas (see Edo (2019) for a recent review of the literature). The literature also shows that, once explicitly included in the analysis, labor market regulations (such as the presence of minimum wages or the rigidity of labor contracts) have relevant implications for the reaction of natives' labor market outcomes after new inflows of immigrants (Angrist and Kugler, 2003; D'Amuri and Peri, 2014; Edo, 2016, 2019; Bächli and Tsankova, 2020). However, one systematic feature of the literature is that labor market regulation is assumed to be, either implicitly or explicitly, exogenous to the presence of immigration. To the best of our knowledge, this assumption has never been tested. Nevertheless, concerns related to the implications of immigration on countries' institutions have been raised in response to the growing inflows of immigrants from a broader set of institutionally and economically different countries and with different cultural backgrounds. If labor market regulation responds to immigration, then the *overall* labor market effect of immigration has still not been completely unveiled.

This paper fills this gap by studying the response of labor market regulation to immigration (in terms of both size and composition), using a dataset on 36 labor laws for 70 countries over a period of 40 years. Our analysis combines three innovative features compared to the existing literature. *First*, we build a novel labor regulation measure that focuses on workers' protection, which we call the *workers' protection index* (WPI). This measure captures how much the regulation is protecting employees in the workplace, and it allows us to track the evolution of labor regulation over an extended period. We show that our measure is highly correlated with alternative available measures of workers' protection and is related to economic and labor market outcomes. *Second*, we investigate the response of workers' protection to immigration, in terms of both size and composition. We believe that it is important to consider both aspects of immigration (size and composition) because of their effects on the labor market. The size of the immigrant population mechanically influences both labor supply and the skill composition of the workforce, which could have far-reaching implications for labor regulation. As for the composition of immigration, we follow the literature in using an epidemiological approach (Spilimbergo, 2009; Collier, 2013; Docquier et al., 2016; Valette, 2018). Immigrants' origin-country experience of regulation and institutions can affect their behavior in the destina-

tion country, which can in turn influence the functioning of the labor market in general, as well as the regulation of workers' protection. In our analysis, we account for alternative complementary or competing immigration effects, such as immigrant population diversity, polarization, and skill selection. *Third*, we perform an exploratory analysis on the mechanisms that could explain the response of labor regulation. We first test the response of specific areas of labor law regulation, and then we investigate the implications of immigration on union participation and political parties' position on labor groups.

Our paper provides three main findings. We *first* find a strong and positive effect of migrants' experience of the degree of workers' protection in their origin countries—measured by an epidemiological term *à la* Spilimbergo (2009)—on workers' protection in destination countries. Namely, welcoming immigrants from countries with a high level of protective labor regulation (such as France) fosters a positive response of workers' protection in destination countries. An increase in the epidemiological term of one standard deviation increases the workers' protection index by 7.8% of WPI standard deviations. The effect is robust to our demanding specification, a battery of robustness checks, falsification tests, and alternative competing effects such as diversity, polarization, or skill selection. Additionally, the size of the immigrant population has a small negative or null influence on workers' protection. *Second*, our results show that two areas of labor regulation are particularly influenced by immigration: worker representation laws (e.g., laws concerning the right to unionize or allowing collective bargaining) and employment forms laws (e.g., laws concerning the flexibility of contracts). Our paper provides suggestive evidence that immigrants' experience of labor regulation in their origin countries influences their propensity to unionize: immigrants from countries with higher level of workers' protection are less inclined to seek protection via unions in the destination country, thereby reducing the size of the unionized worker population. We then show that political parties' favorable position on labor groups is negatively related to the size of the unionized workforce, which suggests political actors' attempts to counterbalance the loss of unions' bargaining power as a result of a decreased rate of unionization. *Finally*, taking the baseline coefficients as the "true" ones and an actual variation in the immigrant population in terms of size and composition over the period 1970–2010, we provide back-of-the-envelope computations to evaluate the magnitude of the labor regulation response to immigration. On average, the computations predict that immigration reduces the WPI by 4.2% standard deviations over the analyzed period. Although the effect is highly heterogeneous across countries, depending on both the size and composition of the immigrant population, the average negative response for OECD high-income countries is 72% stronger compared with non-OECD countries.

Assessing the effect of immigration on countries' worker protection raises a number of identification challenges that need to be properly addressed to avoid biased estimates. Time-varying omitted factors can simultaneously influence the evolution of workers' protection and immigrants' location. Workers' protection is a persistent or path-dependent variable that can be explained, to a large extent, by its own history. Reverse causality also plays a role as workers' protection can influence the size and composition of the immigrant population. In this paper, we address these challenges by using a dynamic panel specification and estimating it with a system GMM with both internal and external instruments. We create external instruments based on two complementary IV strategies: a shift-share approach (Card, 2001; Moriconi et al., 2018) and a gravity-model approach (Alesina et al., 2016; Docquier et al., 2020).

We follow Bahar et al. (2020b) and use both methodologies simultaneously to build predicted measures of the size and composition of the immigrant population. Despite their wide use, the two IV approaches are open to criticism; the critiques to the shift-share approach indicate a possible threat from persistent local conditions (Jaeger et al., 2018; Goldsmith-Pinkham et al., 2020) and potential correlations in the error terms due to similar initial

distributions of immigrants by country of origin across destination countries (Adao et al., 2019). These concerns are less worrisome in our specific case because of the wide set of historical events that undermine persistent local factors (e.g., the fall of the Soviet Union in 1989, the 1965 amendments to the Immigration and Nationality Act in the US, the constitution of the European Union, and the activation of the Schengen Area in 1995). Following Goldsmith-Pinkham et al. (2020), we show that the initial shares of the most relevant origin countries for our instrument are not related to the initial conditions in the destination countries. Moreover, we find no correlation between our predicted measures and pre-period economic and social trends, nor do we find any significant variations in the error terms after clustering countries by a similar distribution of immigrants' origin countries in the 1960s. Concerning the gravity-model approach, concerns would arise if the included gravity controls were to affect the evolution of labor regulation through other channels, such as trade or foreign direct investment. However, the highly parsimonious estimated gravity model makes us more likely to satisfy the exclusion restriction that can reasonably support a careful causal interpretation of the results once the predicted stocks are used.

This paper contributes to three broad strands of literature. The first is on the overall impact of migration on the labor market in destination countries' and more specifically on natives' labor market outcomes. The overall consensus from a broad set of evidence using different assumptions and methodological approaches is that, on average, immigration has a small or null effect on natives' wages and employment (Borjas, 2003; Peri and Sparber, 2009; Ottaviano and Peri, 2012; Manacorda et al., 2012; Edo, 2019), although it can have some relevant redistributional effects depending on immigrants' location and education level (Card, 2009; Borjas, 2016). More closely related to our work, part of the literature investigates the labor market effect of immigration by exploring the heterogeneity in the effects across labor market institutions and regulations. Angrist and Kugler (2003) and D'Amuri and Peri (2014) reveal that in more rigid labor markets, natives take more time to adjust to the immigration supply shock by moving toward more complex and less manual tasks, compared with natives in less rigid labor markets. Using French data, Edo (2016) shows that an immigration shock reduces the wages of natives covered by fixed-term contracts and the employment of natives covered by indefinite-term contracts. However, exploiting the non-linear distribution of minimum wages across 51 US states, Edo and Rapoport (2019) provide evidence that higher minimum wages can reduce the negative effect of low-skilled immigration on less educated native workers. Moreover, when protected by labor regulations, natives hold more benign attitudes toward immigrants, which also influences their voting preferences (Bächli and Tsankova, 2020). Even though the literature recognizes the importance of labor regulation for various outcomes, to the best of our knowledge, none of the previous works looked at the effect of immigration on workers' protection, or more broadly on labor regulation. So far, the literature has treated immigration as exogenous to labor regulation, fixed over time, and "absorbed" by eventual geographic time-invariant fixed effects. Our paper aims to fill this gap by investigating the labor regulation response to immigration.

The second broad strand of literature we contribute to investigates the legal institutions' determinants and how they respond to the international movement of factors. Although the literature provides evidence in a cross-sectional setting for the relevance of legal origin and the process of legal transplants in explaining cross-country differences in legal regulation (Botero et al., 2004; Berkowitz et al., 2003), less is known about the determinants of its evolution over time. Focusing on financial sector regulation, Abiad and Mody (2005) show that economic shocks or political ideology can explain the global process of financial liberalization. Facchini and Willmann (2005) provide a theoretical model based on the common agency problem explaining the regulation reaction to the international movement of factors, such as trade or immigration. Additionally, concerns about the response of institutions to immigration have been raised with respect to the potential disruptive effect of norms and habits brought by immigrants coming

from distant countries on well-functioning Western institutions (Collier, 2013; Borjas, 2015). However, the available set of evidence shows that immigrants have a small positive or no effect on market-functioning institutions and economic freedom (Clark et al., 2015; Powell et al., 2017; Baudassé et al., 2018). With an origin-country perspective, few authors provide evidence that immigrants' experience of institutions and productive capacity in destination countries has an effect on origin countries' institutions (Spilimbergo, 2009; Docquier et al., 2016; Valette, 2018). Our paper contributes to this literature by providing the first set of evidence, on the response of a distinct and important part of institutions, namely labor regulation, to immigration on a sample of 70 destination countries over a long time span (1970–2010).

Third, we contribute to the comparative legal studies literature and more specifically to the literature on legal transplants or law diffusion. The concept of legal transplants was introduced in the seminal work of Watson (1974). As one of the examples, the author provides an insight that the private law of many countries is fundamentally based on the reception of Roman law and argues that society's laws do not usually develop as a logical outgrowth of solely its own experience. Moreover, the author argues that the law cannot be used as a tool to understand societies without taking legal transplants into account. In the contemporary legal transplant literature, comparative lawyers agree that a country's legal culture can be transplanted through legal education, methods, and mentalities (Twining, 2009; Del Duca and Levasseur, 2010; Graziadei, 2006). Hans (2017) explains the importance of connections between international scholars and other research networks for transplantation of trial by jury. We contribute to this strand of literature by providing the first empirical evidence on how immigrants can be a source of legal transplants.

The rest of the paper is organized as follows. Section II presents the data, the construction of our workers' protection index and immigration variables. Section III shows our empirical approach, the identification strategies, and potential alternative effects driven by immigration. Section IV shows the main results of the analysis, the robustness checks, and the falsification tests. Section V explores the potential mechanism on the different subcomponents of the workers' protection index and on immigrants' participation in unions. Section VI discusses the magnitude of the effect after back-of-the-envelope computations of the effects. Finally, Section VII concludes.

II Data and Stylized Facts

This paper combines different data sources for 70 countries over a long time span from 1970 to 2010. Section II.A describes the data associated with workers' protection, explains the construction of the workers' protection index, and shows relevant correlations with alternative measures of workers' protection and economic outcomes. In Section II.B, we present the immigration data, the construction of the epidemiological term based on level of workers' protection that immigrants experience in their origin countries and the evolution of the immigrant population over time.

II.A Workers' Protection Index

To construct the novel workers' protection index, we use the Leximetric dataset developed by legal scholars (Adams et al., 2017). This dataset quantifies the level and evolution of labor law and workers' protection based on the "law-in-the-books". The Leximetric data on workers' protection covers 117 countries over the 1970–2013 period. For few post-socialist countries, the data are available only after 1990.[1] The dataset documents the degree of legal protection associated with permanent and part-time workers. However, when the law sets different standards across

[1] To have a more balanced sample, we keep only the countries that have data from 1970 on in our final sample.

different groups of workers (e.g., blue-collar and white-collar workers), the dataset enlists the degree of protection associated with the least protected group. This aspect implies that the dataset is capturing either the average or the minimum degree of protection guaranteed to the least protected workers.

The dataset includes 36 relevant variables associated with different aspects of workers' protection.[2] We assign a value between zero and one to each of those variables, where zero stands for no protection/lowest protection possible, while one stands for the maximum protection available in that area. All the variables are categorized into five broad areas related to workers' protection: employment forms laws ($EmptForm$), working time laws ($WorkTime$), worker dismissal laws ($WkrDismis$), worker representation laws ($WkrRepr$), and industrial action laws ($IndAction$). The first area represents the law governing the definition of the employment relationship and employment forms, which accounts for the legal difference across different employment forms and their maximum duration. It has maximum value, for instance, when workers that have temporary/fixed-term contracts are protected. $WorkTime$ covers issues related to holidays, extra compensation in case of overtime working hours, and the duration of working weeks. The variables take the value of one when holidays and overtime activities are well compensated and when workers have a reasonable amount of working hours per week/day. The third area ($WkrDismis$) is related to the length of notice before dismissal, the constraints that employers have to face before firing an employee, and eventual compensation after dismissal. The fourth area ($WkrRepr$) provides information related to workers' right of unionization and collective bargaining and on unions' right to nominate representatives for companies' boards of directors. Variables take the value of one when the workers have a right to be represented and voice their concerns through unions. The last area ($IndAction$) is related to the rights of industrial actions and striking. This area covers the part of legislation that grants workers' rights to strike and reduces employers' rights to lockout. These five broad areas have a high degree of correspondence with the categories analyzed by Botero et al. (2004) in a cross-sectional setting, which later provided the methodological basis for the World Bank's Doing Business reports.

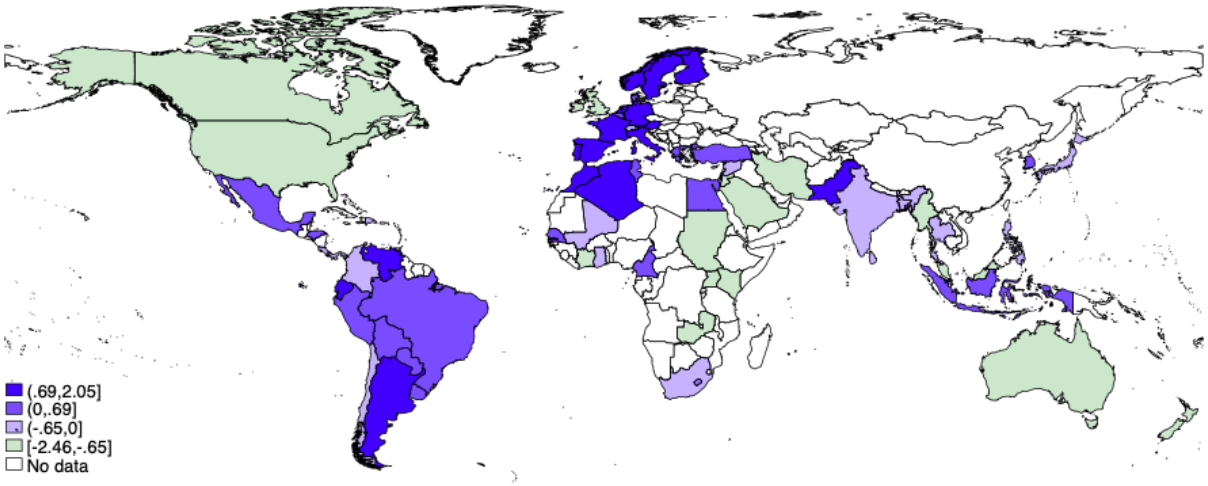
The wide range of legal issues covered by the Leximetric data gives us a comprehensive measurement of different aspects related to workers' protection. Nonetheless, to have a general overview of the evolution of labor law regulation, we perform the following steps to construct one synthetic measure of workers' protection at the country level. First, following the structure of the data, we build five indicators associated with the five areas of working protection measured by the Centre for Business Research (CBR) researchers. Following Preacher and MacCallum (2003) guidelines, we aggregate the variables associated with each area through a factor analysis, and we standardize them with mean zero and a standard deviation equal to one.[3] Second, we perform a second factor analysis over the five aggregated indicators associated with the five legislative areas of workers' protection to build one synthetic indicator. We define the first standardized component of this latter factor analysis as our *workers' protection index* (WPI).

Figure 1 shows the geographical distribution of the average workers' protection index. European countries (excluding the United Kingdom) are characterized by a high level of WPI, with Portugal having the highest average WPI (2.05). Pakistan is the only country in Asia with a WPI comparable to Continental Europe, which has a WPI of 1.12. Among high-income developed societies, countries with a common law legal system (e.g., the United States, United Kingdom, Australia, and New Zealand) are characterized by a systematically lower level of workers'

[2] A list of all workers' protection variables is available in Table A-1.

[3] The results of the factor analysis are available in Appendix B. Since the structure of the data and the relation among variables are theoretically well defined by the CBR researchers, we follow Preacher and MacCallum (2003), who suggest implementing factor analysis in these cases to identify the sources of common variation, as opposed to a principal component analysis, which aims to explain as much variance as possible. The indexes are the first standardized component from each specific legislative area.

Figure 1: Workers Protection Index - Geographical Distribution



Note: Authors' calculations on CBR Leximetric data. The figure plots the average standardized workers' protection index by quartile at the country level over the 1970–2010 period.

protection. The United States in particular is characterized by the lowest WPI level in our sample (-2.46). This is not surprising, since common law legal systems are on average less codified and more protective on the side of investors (La Porta et al., 1997, 2008).[4] Concerning developing countries, Latin American countries are characterized by a high level of workers' protection overall. The only exception is Chile (-0.35), which is characterized by a lower level of WPI compared to its neighboring countries, as result of the changes in law and institutions under the Pinochet regime (Borzutzky, 2005). A large degree of heterogeneity in WPI is reported in African and Middle Eastern countries, from countries with a reasonably high degree of WPI, such as Algeria (1.59) and Morocco (0.76), to countries with a low level of WPI, such as Saudi Arabia (-1.06) and Kenya (-1.2).

The historical evolution of the workers' protection index is available in Figure 2. The dotted blue line in both Figure 2(a) and 2(b) shows that the degree of workers' protection is on an increasing trend from 1970 to 2010, moving from an average level of -0.6 to 0.5. However, some heterogeneous trends depending on countries' economic development and legal origin are also evident. Figure 2(a) shows that OECD high-income and non-OECD countries were experiencing similar levels of WPI until 1975. However, from 1980 on, the WPI grows faster in OECD high-income countries compared to others. In terms of legal origin, even though the trends are parallel from 1970 to 2010, countries with a civil law legal system experienced a substantially higher degree of WPI compared to countries with a common law legal system. This evidence is in line with the literature that recognizes systematic differences in the level of regulation across countries (La Porta et al., 1997). Figure 2(b) plots the WPI with its five subcomponents. During the whole analyzed period, worker dismissal, worker representation, and employment forms protection laws have increased as the aggregated index. However, the industrial action laws and working time protection laws have rather stagnated.

The Leximetric data are able to tap into multiple aspects of the legislation associated with workers' rights. Moreover, as the authors of the database point out, the data aim to capture how the law protects the labor relations

[4] In Table D-2, we look at the possible determinants of the values shown in Figure 1 using a simple OLS. We confirm a strong negative and highly significant relationship between common law legal origin and WPI. Depending on the set of controls, we find positive correlations of WPI with the epidemiological term, GDP p.c. and democracy, whereas we find a negative correlation with the size of immigration.

Figure 2: Workers' Protection Index - Evolution over Time

(a) WPI by development level and legal origin

(b) WPI and its sub-components

Note: Authors' calculations on CBR Leximetric data. Figure (a) plots the average standardized workers' protection index by destination countries' level of development and legal origin. Figure (b) plots the average standardized workers' protection index and its five subcomponents.

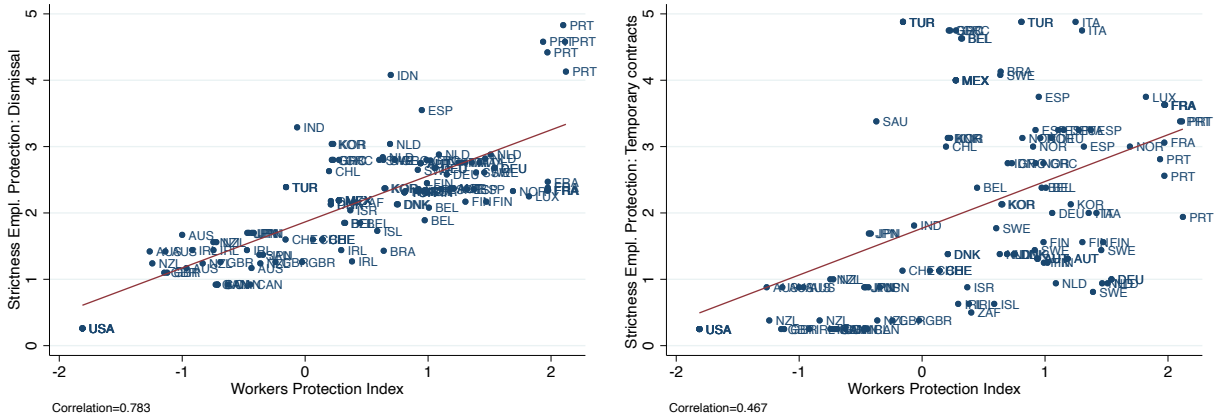
between employers and employees, rather than the actual cost that the legislation imposes on employers.[5] However, the Leximetric dataset is not the only one available that encompasses the legal aspects related to workers' protection. Over a smaller sample of countries and a reduced time span, the OECD Employment Protection database provides some indicators of employment protection (OECD, 2013). In particular, we focus on two indicators that are available for 33 countries over the 1990–2010 period. The first is the index of the strictness of employment regulation on individual and collective dismissal (DI^{OE}). It captures procedures and costs involved in dismissing workers, such as procedural inconveniences that employers have to face through the dismissal process, notice period, and severance pay. Second is the index of the strictness of employment regulation on temporary contracts (TC^{OE}). It measures the duration, regulation, and conditions associated with temporary contracts compared to permanent contracts. Both indicators have high values when workers have a higher degree of protection (i.e., more hindrances to employers when they want to fire a worker and when they want to hire a temporary/fixed-term worker). Figure 3 shows the correlations between the WPI and the two OECD indicators. In both Figures 3(a) and 3(b), the WPI is positively correlated with the OECD indicators, and the correlations are statistically significant at a 1% level. Additionally, in Figure D-2 we cross-validate each of the five WPI subcomponents with the related cross-sectional labor regulation measures available Botero et al. (2004), and we find strong and positive correlations between the proxies. Overall, we provide evidence on correlations across different related data sources for our measure of workers' protection and its main subcomponents, which is reassuring for the external validity of our measure.

Our focus on the evolution of labor regulation and labor market institutions is also driven by the potential impact on the economy, in particular on workers' wages, employment, and the ability to adapt to labor market shocks (see Botero et al. (2004); Arpaia and Mourre (2012); D'Amuri and Peri (2014); Nataraj et al. (2014)).[6] To test the

[5] The CBR researchers specify three main reasons for this. First, it is not possible to infer from the existence of a given legal rule any effect on behaviors that will affect firms' costs. Second, the existence of a law-in-the-books does not imply the degree of its actual observation in practice. Third, an increase in workers' protection can also have beneficial effects on firms' costs, such as the reduction in transaction costs after introducing collective bargaining.

[6] Additionally, the legislative apparatus that determines the level and evolution of the WPI can be a proxy for how much a given country or

Figure 3: Workers' Protection Index - Correlations with OECD Employment Protection Data



(a) Individual and Collective Dismissal

(b) Temporary Contracts

Note: Authors' calculations on CBR Leximetric data (x-axis) and OECD Employment Protection Database (y-axis). The figure plots the country-period level of the standardized workers' protection index on the country-period level of the index of the strictness of employment regulation on individual and collective dismissal (DI^{OE}) (Figure (a)) and the country-period level of the index of the strictness of employment regulation on temporary contracts (TC^{OE})(Figure (b)).

Table 1: Workers' Protection and Labor Market Outcomes

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Estimation:	FE	FE	FE	FE	FE	FE	FE	FE
Time:	1970-2010	1970-2010	1970-2010	1970-2010	1970-2010	1970-2010	1970-2010	1970-2010
Dep var:	Unemp rate	Labor produc	Hrs worked pc	Gini	Unemp rate	Labor produc	Hrs worked pc	Gini
WPI_t	2.052***	4.958***	-47.747**	-0.010**				
	(0.708)	(1.743)	(19.301)	(0.004)				
WPI_{t-1}					2.019***	3.840**	-37.270**	-0.007
					(0.740)	(1.596)	(16.159)	(0.004)
Year FE	✓	✓	✓	✓	✓	✓	✓	✓
Country FE	✓	✓	✓	✓	✓	✓	✓	✓
Adj. R-Square	0.61	0.92	0.92	0.96	0.62	0.93	0.94	0.96
Countries	68	47	47	69	68	47	47	69
Observations	322	394	394	495	302	353	353	466

Note: Standard errors are clustered at the country level. * p<0.1, ** p<0.05, *** p<0.01. The dependent variables are unemployment rate, labor productivity per hour worked, annual hours worked per worker, and Gini index after tax. See Appendix A for further information on the variables.

economic relevance of our workers' protection index, Table 1 shows the partial correlation between WPI and several economic outcomes. We use, as a dependent variable, four different labor market outcomes: unemployment rate, labor productivity per hour worked, annual hours worked per worker, and the Gini index after taxes and transfers. We perform our analysis using the majority of countries depicted in Figure 1 with five-year time periods from 1970 to 2010, and we investigate the relationship between WPI and economic outcomes in the same year and with a one-period lag. To avoid the issue of bad controls (see Angrist and Pischke (2008)), our specification includes only

state tries to take care of workers' well-being, which is usually depicted as the weakest in a society. Understanding its evolution can give an intuitive picture of how countries become more regulated and attentive toward one of the most vulnerable groups (Hunt, 2003).

country and year fixed effects in order to capture time-invariant unobserved heterogeneity and common trends. Two conclusions can be drawn from Table 1. First, the WPI is indeed related to relevant labor market outcomes, and the partial correlations are on average statistically significant at a 5% level. Second, the direction of the relationship is heterogeneous across labor market outcomes. The change in the workers' protection index is positively associated with the unemployment rate and labor productivity, whereas it is negatively associated with the total number of hours worked and inequality. Nonetheless, since the scope of our paper is to study the determinants of the evolution of WPI rather than its economic implications, here we only highlight the potential implications for the economy rather than provide an in-depth causal analysis.

II.B Immigration Data and the Epidemiological Term

We combine two different data sources to have a more comprehensive picture of the immigrant population over a broad sample of destination countries. First, we rely on the Global Migration data by Özden et al. (2011), which combines several censuses and population registers. This dataset provides decennial matrices of bilateral migration stocks between 1960 and 2000. Owing to its long time span and coverage of over 200 destination and origin countries, this dataset has been used in several cross-country and panel studies (e.g., Beine and Parsons (2015); Cattaneo and Peri (2016); Bove and Elia (2017)). We combine and harmonize it with the World Bank Bilateral Migration Matrix of 2010 (World Bank, 2010), such that we have a decennial coverage from 1960 to 2010. Finally, to increase the number of data points, we interpolate the decennial bilateral migration stocks to five-year periods.[7]

To measure the size of the immigrant population, we first compute for each country of destination d at year t the share of immigrants in the total population of 2000 as follows:

$$ShareMig_{d,t} = \frac{MIG_{d,t}}{Pop_{d,2000}}, \tag{1}$$

where $ShareMig_{d,t}$ is the share of immigrants and $MIG_{d,t}$ is the total stock of immigrants. Following Moriconi et al. (2018), we compute the share of immigrants using the population in a fixed year as the denominator.[8] Such measure is a proxy of immigrant population size, which can influence countries' economy and legislative aspects. For instance, a higher share of immigrants would imply a higher labor supply, which can have a direct effect on wages and employment (see Borjas (2003); Edo (2019)). To avoid potential unwanted effects on native workers' economic outcomes, institutions could react by changing labor market institutions and laws.

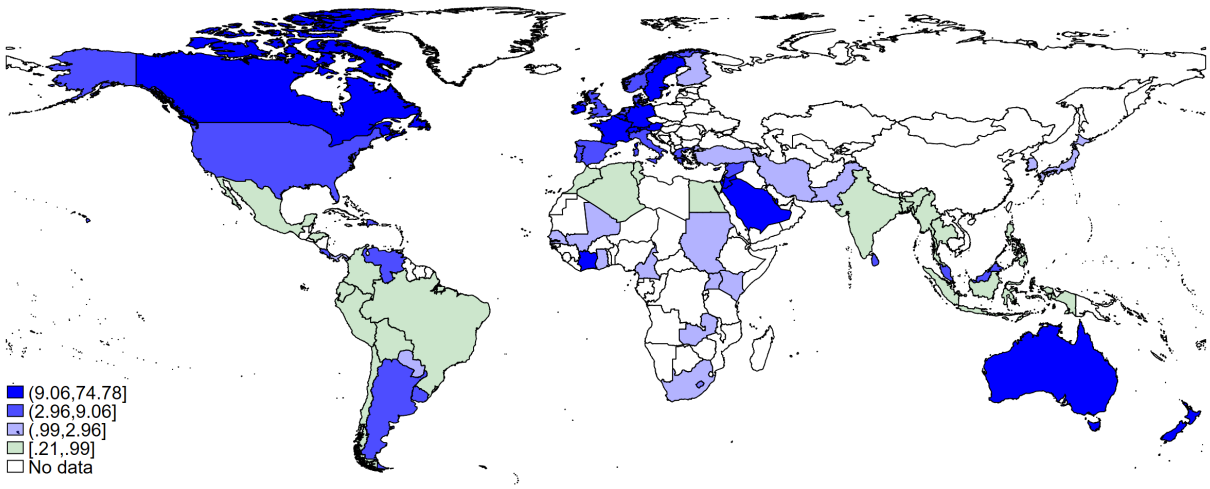
Figure 4 shows the geographical distribution of the average share of immigrants as computed in equation (1) over the period 1970–2010. OECD high-income countries are characterized by a sizeable migration share. However, Qatar has the highest value in our sample (74.78), followed by Israel (30.15), Luxembourg (26.05), and Singapore (24.59).[9] Developing countries in Latin America, Africa, and Asia are characterized by a lower share of immigrants. Looking at the time variation of the share of immigrants, Figure 5 shows that the average share of immigrants evolves with a similar trend both across countries' level of development (Figure 5(a)) and across countries' legal origin (Figure 5(b)).

[7] We perform such interpolation to have more data points, which will be relevant for the strength of our estimation strategy. Nevertheless, when we remove interpolated observations (i.e., 1975, 1985, 1995, and 2005), the main results remain unchanged, as column (4) in Table 3 shows.

[8] We test our main results using the share of immigrants over the current population rather than the share of immigrants over a fixed population, as shown in equation (1). The main results remain unchanged. Results are available upon request.

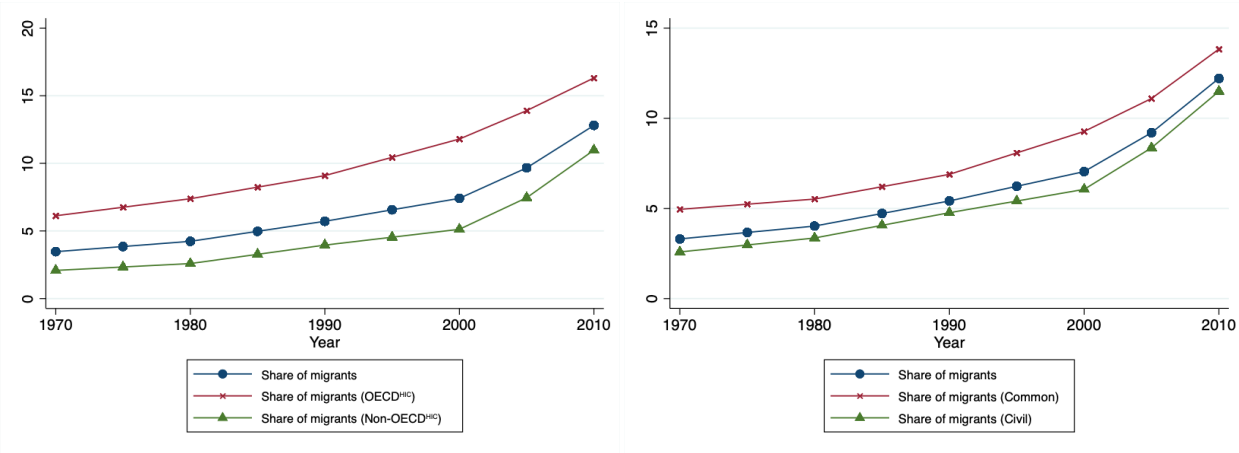
[9] Those countries are characterized by a large immigrant population because of the structure of the labor market and institutions (see De Bel-Air (2014) for Qatar). The large size of the immigrant population, for example in Israel, is related to historical reasons, such as the exodus of soviet Jews from Russia to Israel in the 1990s after the collapse of the USSR (Smooha (2008)).

Figure 4: Share of Immigrants - Geographical Distribution



Note: Authors' calculations on Özden et al. (2011) and World Bank data. The figure plots the average share of immigrants over the 2000 population by quartile at country level over the 1970–2010 period.

Figure 5: Share of Immigrants - Evolution over Time



(a) OECD^{HIC} vs. Non-OECD^{HIC}

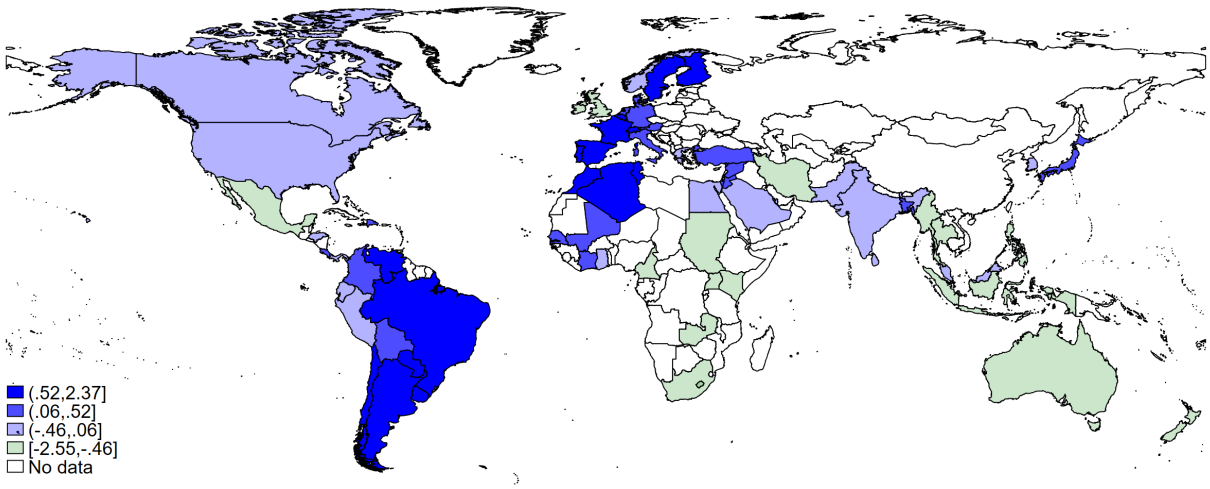
(b) Civil Law vs. Common Law

Note: Authors' calculations on Özden et al. (2011) and World Bank data. Figures (a) and (b) plot the country average share of immigrants over the 2000 population by destination countries' level of development (Figure (a)) and legal origin (Figure (b)).

Migration can influence destination countries not only because of its size but also because of its composition. Aspects such as immigrants' education and their capacity to expand the knowledge set of a given country as a result of their novel competences and skills are just a few examples of how immigrants' characteristics could affect natives' behavior and countries' economies (e.g. Borjas (2019); Bahar et al. (2020b); Moriconi et al. (2019); Docquier et al. (2020)).[10] In this paper, we focus on the fact that immigrants may bring with them their experience, norms, habits, or, more broadly, institutions from their country of origin. As Collier (2013) points out, immigrants can be a source of an *epidemiological effect*, if immigrants convey the institutions and social norms of their country of origin. Giuliano

[10]Even though aspects such as diversity, polarization, and skill selection are not the main focus of our paper, we test for them in Table 4.

Figure 6: Epidemiological Term - Geographical Distribution



Note: Authors' calculations on Özden et al. (2011), World Bank data, and CBR Leximetric data. The figure plots the country average epidemiological term (as we compute in equation (2)) by quartile at country level over the 1970–2010 period.

and Tabellini (2020) show that European immigrants' preferences toward redistribution could have influenced US natives' political preferences during the age of mass migration. We follow Spilimbergo (2009) and Valette (2018) to account for potential origin-specific and epidemiological effects by computing the following index:

$$Epid_{d,t} = \sum_{o} \frac{MIG_{o,d,t}}{\sum_{o}^{O} MIG_{o,d,t}} * WPI_{o,2000} = \sum_{o} \overline{mig}_{o,d,t} * WPI_{o,2000}. \tag{2}$$

The index $Epid_{d,t}$ captures for a country of destination d at year t the degree of workers' protection experienced by its immigrant population in their origin country. It is measured as a weighted average of the WPI in the origin countries in the year 2000, using as weights the share of immigrants coming from country of origin o and living in country d over the total immigrant population in country d.[11] We proxy for the degree of workers' protection in the country of origin with the WPI in the year 2000 for two reasons. First, the WPI is a rather persistent variable; hence, by using the value in 2000, we capture the average level of workers' protection in the origin. Second, a lot of countries enter in the Leximetric data starting only from 1990. To have the broadest geographical coverage in terms of WPI for origin countries, we take as a reference the year 2000. For such year, we are able to compute the WPI for 116 countries of origin. Although we cover the majority of the countries in terms of size and population, for a few countries of origin, we still do not know the level of WPI. We then impute the missing countries with the average level of WPI in 2000 based on their legal origin.[12]

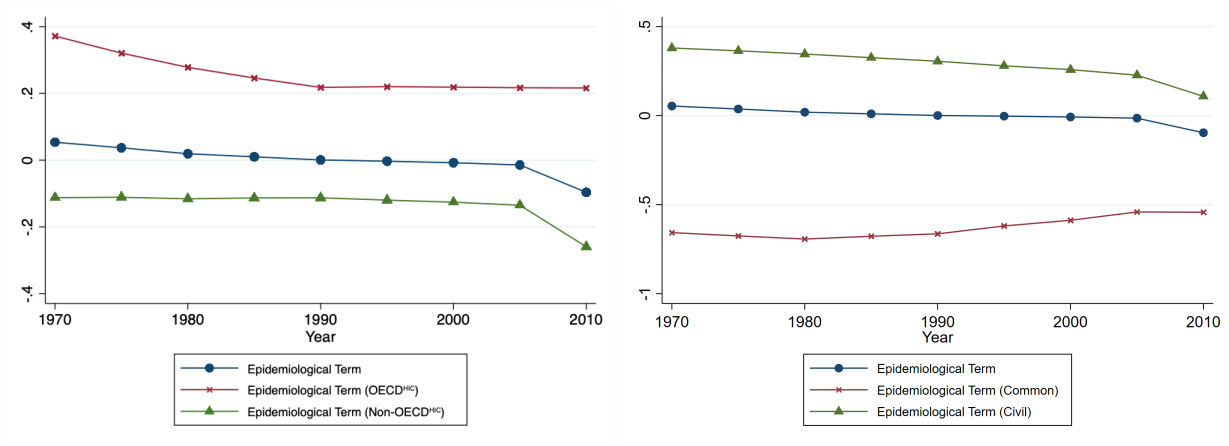
Figure 6 presents the geographical distribution of the average epidemiological term over the period 1970–2010.

[11] Alternatively, Table 4 provides the results after computing the epidemiological effect: (i) using as weights the share of immigrants coming from country of origin o and living in country d over the total population in destination country d, and (ii) using a time-variant definition of the WPI at the origin. The main results remain unchanged.

[12] As Figure 2(b) and Table D-2 show, the legal origin rather than the level of development is one of the best predictors of the level of workers' protection. We are aware that this imputation procedure might affect our results. For this reason, we perform in Table 3 two robustness checks. First, we drop from the sample countries characterized by a high percentage of imputed WPI within their epidemiological term (i.e., more than 30% of the immigrant population coming from a country with an imputed WPI). Second, we compute the epidemiological term with different imputation methods: (i) not imputing the values of missing countries ($Epid\ strict$); (ii) imputing the missing countries with the minimum value by legal origin ($Epid\ min$), and (iii) imputing the missing countries with the maximum value by legal origin ($Epid\ max$). The results remain unchanged across these different robustness tests.

The distribution is rather heterogeneous across continents. The country characterized by the highest epidemiological term is Morocco (2.37), followed by Luxembourg (1.97), and Tunisia (1.76). On the other end, countries with the highest share of immigrants from countries with a low WPI are Mexico (-2.55), Indonesia (-1.9), and Ireland (-1.89).

Figure 7: Epidemiological Term - Evolution over Time



(a) OECD^{HIC} vs. Non-OECD^{HIC}

(b) Civil Law vs. Common Law

Note: Authors' calculations on Özden et al. (2011), World Bank data, and Leximetric data. Figures (a) and (b) plot the country average epidemiological term (as we compute in equation (2)) by destination countries' level of development (Figure (a)) and legal origin (Figure (b)).

Figure 7 provides some more clear evidence on the evolution and average value of the epidemiological term across countries' level of development and legal origin. First, as the dotted blue line shows, the epidemiological term experienced a slow decline from the 1970s to 2010. This trend shows that, among our sample of countries, through time new immigrants were coming from countries with a lower level of workers' protection compared to the ones already in the destination countries. Second, developed and civil law countries are characterized by a higher proportion of immigrants from countries with high WPI, compared to developing and common law countries. Third, common law countries are the only ones that experienced a small but positive trend in the epidemiological term.

III Empirical strategy

Our goal is to empirically examine the response of workers' protection to immigration, in terms of both size and composition by countries of origin. Section III.A describes our linear dynamic panel model specification and the system GMM estimation technique we employ. In Section III.B we present our shift-share approach and the gravity model, which are necessary to instrument our variables of interest within the system GMM framework. Last, Section III.C discusses alternative and competing effects driven by immigration: diversity, polarization, and skill selection.

III.A Empirical model and estimation technique

Our estimation strategy uses five-year periods of all variables (from 1970 to 2010) to address the medium-run perspective of law changes, to rule out short-run (e.g., annual frequency) fluctuations in the data, and to better

harmonize the occurrence of gaps from the mixed frequency of the data.[13] All of our explanatory variables are lagged with a one five-year period as it usually takes a few years before the labor laws respond to changes induced by our explanatory variables. Since labor law is highly persistent over time, we use a linear dynamic specification.[14] Other studies used the same dynamic panel specification to measure the effect of migration on different institutional outcomes (Spilimbergo, 2009; Docquier et al., 2016). We estimate the following model:

$$WPI_{d,t} = \alpha + \beta WPI_{d,t-1} + \gamma ShareMig_{d,t-1} + \delta Epid_{d,t-1} + \theta \mathbf{X_{d,t-1}} + \eta_t + \zeta_d + \epsilon_{d,t}, \tag{3}$$

where $WPI_{d,t}$ is the workers' protection index in destination country d at year t. The $WPI_{d,t-1}$ is one-period lag of the outcome variable that allows us to account for the persistence in the workers' protection index. Our variables of interest are both $Epid_{d,t-1}$ and $ShareMig_{d,t-1}$, which are accordingly the epidemiological term and the share of immigrants at the destination country d in period $t-1$. In equation (3), $\mathbf{X_{d,t-1}}$ is a vector of controls (such as GDP, political regime, and human capital) that can potentially simultaneously our variables of interest and the outcome. In addition, ζ_d denotes a country fixed effect, η_t is a time fixed effect, and $\epsilon_{d,t}$ is the error term.

The vector of controls that we include are borrowed from the economic growth literature and are ex ante important for both the workers' protection index and immigration: economic development level, political regime, and human capital level. More developed countries, on average, have higher values of WPI (recall Figure 2). The political regime is another relevant control because we observe that labor regulation may be influenced by political shocks—for instance, as was the case under the Pinochet regime (Borzutzky, 2005). Finally, we can reasonably argue that human capital, contributing to the overall development of a country and being correlated with a country's institutions (Acemoglu et al., 2014; Faria et al., 2016), can also contribute to the development of labor market institutions.

Our analysis employs a system GMM estimator to estimate equation (3). This estimation technique accounts for the unobserved heterogeneity, persistence, and potential endogeneity of other regressors. Blundell and Bond (1998) and Bond et al. (2001) suggest that system GMM is the most adequate estimator in a dynamic panel setting if the time series are highly persistent, as they are in our case. This estimation strategy allows us to circumvent the dynamic panel bias stemming from the inclusion of the lagged dependent variable in a within-group estimator with a short time period, also known as the Nickel bias (Nickell, 1981). We use a two-step system GMM procedure, which is asymptotically more efficient than the one-step procedure, but it has potentially downward-biased standard errors in small samples (Bond et al., 2001). Consequently, we use Windmeijer (2005) finite sample correction, which gives more accurate estimates in small samples. The validity of the estimator relies on crucial Arellano and Bover (1995) conditions, which are tested with Hansen's J and difference-in-Hansen tests along with each regression. Furthermore, we follow Bazzi and Clemens (2013) by performing various weak instrument diagnostics to ensure that the estimated coefficients are unbiased.

Within the system GMM framework, we use both internal and external instruments to obtain consistent estimates. For the internal instruments part, the instruments used in the difference equation are lagged levels, whereas the instruments in the level equation are lagged differences of the corresponding variables; the regressions in both differences and levels are then combined into a single system. To avoid arbitrary exogeneity assumptions, we treat all right-hand-side variables as endogenous, as is most common in the literature. However, this decision leads to a

[13] To further scrutinize the empirical analysis, we experiment with alternative specifications and different time periods (i.e. 10-year instead of 5-year periods) in Table 3.

[14] We can see the high persistency of the WPI in Figure 2, as well as in our main results in Table 2 where our autoregressive coefficient is always above 0.8.

large number of instruments that can potentially overfit the instrumented variables. We handle this by collapsing the matrix of instruments and reducing the lag structure to have fewer instruments than countries, as suggested by Roodman (2009). We keep the same instrument set across all regressions to be transparent and to avoid the "ad hoc" choice of internal instruments for each specification. More specifically, we instrument $WPI_{d,t-1}$ always with its third to seventh lag, and $X_{d,t-1}$ with its second to fourth lag.[15] As for our variables of interest, $ShareMig_{d,t-1}$ and $Epid_{d,t-1}$, we instrument them using external instruments which we create using the shift-share and gravity approach. In the next subsection, we explain the construction of our external instruments in more detail.

III.B Identification strategy: shift-share and gravity-model based instruments

Estimating γ and δ from equation (3) allows us to retrieve the partial correlation between immigration (share of immigrants and the epidemiological term) and countries' workers' protection, after accounting for other controls and the persistency of the dependent variable. However, the estimated partial correlations could be affected by two main sources of bias. First, unobserved time-varying country characteristics, captured by the error term, could influence a country's labor law and immigrants' destination country choice at the same time. The direction of such bias is unclear, since different unobserved factors could play a role. Second, the correlation between immigration and labor law could suffer from reverse causation. For instance, if immigrants are attracted by countries with higher or similar levels of workers' protection compared to their origin country, then both γ and δ would suffer from an upward bias. Using a GMM estimator with internal instruments partially accounts for both sources of bias. However, if unobserved time-varying factors and reverse causation influence not only current but also past immigrant decisions, the source of bias could persist over time. To strongly mitigate these potential biases and estimate the true causal relationship of immigration on workers' protection, we rely on two well-known instrumental variable approaches to build valid external instruments.

Our first instrumental variable approach is based on the shift-share methodology (Card, 2001; Ottaviano and Peri, 2006; Moriconi et al., 2019). The intuition behind this methodology is to use past settlements of immigrants by country of origin as a predictor of subsequent migration flows arising from network effects.[16] We then allocate the aggregate immigration flows by country of origin, mainly driven by push factors, to the sample of destination countries following a historical distribution of the population of immigrants by country of origin. If the historical distributions of immigrants are uncorrelated (or weakly correlated) with the current unobserved factors and the country's labor law, then the predicted migration stocks are also uncorrelated (or, at the very least, less correlated). To compute the predicted bilateral stocks, we first use Özden et al. (2011) data and compute the historical distribution of immigrants from country of origin o in destination country d in the year 1960 as follows:

$$sh_{o,d,1960} = \frac{MIG_{o,d,1960}}{\sum_d^D MIG_{o,d,1960}}. \tag{4}$$

Equation (4) computes the share of immigrants from country o in destination country d in year 1960 over the total stock of immigrants from the same country of origin. We then compute the total aggregate stocks of immigrants from country of origin o for the years $t \in \{1970, 1975, ..., 2010\}$ as follows:

$$TM_{o,t} = \sum_d^D MIG_{o,d,t}. \tag{5}$$

[15] In Table C-3, we test for different lag structures of the internal instruments, and our main results remain robust to various lag structures.

[16] Bertoli and Ruyssen (2018) show that intending migrants are more likely to move to countries where they have peers and friends.

Finally, we can compute the predicted bilateral stocks of immigrants from country of origin o to destination country d in year t as follows:

$$\widetilde{MIG}^{SS}_{o,d,t} = TM_{o,t} * sh_{o,d,1960} \tag{6}$$

Relying on the literature studying the effect of diversity in the immigrant population on countries' economic growth, the shift-share approach is a good predictor of the immigrant population composition as opposed to its size (Alesina et al., 2016; Bahar et al., 2020b; Docquier et al., 2020); we use the predicted bilateral stocks computed in equation (6) to compute a predicted measure of the epidemiological effect ($\widetilde{Epid}^{SS}_{d,t}$). We employ this variable as our external instrumental variable for the epidemiological effect.[17]

The second instrumental variable approach is based on Alesina et al. (2016) and Docquier et al. (2020), which estimate a gravity model to predict the bilateral stocks of immigrants. Following their methodology, we propose a parsimonious gravity model that (i) minimizes the potential violation of the exclusion restriction and (ii) includes year dummies interacted with the geographical distance between origin and destination country. As Feyrer (2019) suggests, these interactions should capture the declining cost of displacement due to a reduction in transportation costs. The gravity model is specified as follows:

$$MIG_{o,d,t} = \beta Dist_{o,d} * I_t + \theta_d + \gamma_t + \epsilon_{o,d,t}, \tag{7}$$

where $MIG_{o,d,t}$ is the stock of immigrants from country of origin o to the country of destination d in year t. The set of controls includes interactions between bilateral distance (weighted by population size) and year dummies ($Dist_{o,d} * I_t$), year fixed effects (γ_t), and destination country fixed effects (θ_d).[18] Given the high number of zeros due to empty bilateral corridors, we estimate equation (7) using a Poisson pseudo maximum likelihood (PPML) estimator, as suggested by Silva and Tenreyro (2006), and we cluster the standard errors at the country level. Table C-1 shows the estimated coefficients of the gravity model. We then use the predicted coefficients from the estimated gravity model to compute the predicted bilateral stocks ($\widehat{MIG}^{G}_{o,d,t}$). Since the estimated predicted bilateral stocks are less driven by reverse causation and unobserved factors, we use them to compute predicted immigration shares ($\widehat{ShareMig}^{G}_{d,t}$). We use this latter variable as an external instrument for our GMM approach.

We follow Bahar et al. (2020b) and use both IV strategies simultaneously to instrument our migration variables: shift-share approach to instrument the epidemiological effect and the gravity-based approach to instrument the share of immigrants. Both instruments pass the Bazzi and Clemens (2013) test on weak instruments in a system GMM context.[19] Despite their common use in the literature, both approaches have some drawbacks. Even though extremely parsimonious, our gravity model could violate the exclusion restriction if countries' geographical closeness has an effect not only on migration but also on the degree of workers' protection. However, if such effect is related to any kind of economic channels, the inclusion of GDP per capita as a control should account for it. Moreover, the average level of countries' workers' protection index is uncorrelated with the number of neighboring countries, which is a proxy for geographical closeness.

Concerning the shift-share approach, criticisms have been raised related to the role of persistent factors: if

[17] We also compute a predicted measure of the share of immigrants $\widetilde{ShareMig}^{SS}_{d,t}$; however, it appears to be a weak instrument.

[18] The measure of bilateral weighted distance comes from Head et al. (2010), and it is based on distances among the biggest cities of the countries weighted by their share of population. Year fixed effects captures common time trends, while country fixed effects captures the time-invariant unobserved heterogeneity in destination countries.

[19] Table C-2 in the Appendix provides the values of the F-test on weak instruments comparable to the values suggested by Stock et al. (2005).

persistent local conditions influence immigrants' location and workers' protection, then an omitted variable bias could arise (Jaeger et al., 2018; Goldsmith-Pinkham et al., 2020). Relying on the assumption of exogenous initial shares for the validity of the instrument, we follow Goldsmith-Pinkham et al. (2020) to provide evidence in Section C in the Appendix that the initial distribution of immigrants by origin across destination countries in the 1960s is exogenous to destination countries' specific factors. By computing the Rotemberg weights across different periods in time, Table C-4 identifies the origin countries that identify the highest variation in the IV.[20] Then, in Table C-5, we show the correlation between the top origin-specific shares identified by the highest Rotemberg weights and a set of country characteristics in 1960. We do not find any significant correlations, both across different origins and in the variation of the predicted epidemiological term, suggesting that our initial shares are exogenous to destination country factors. Finally, using historical data from the Maddison Project (Bolt et al., 2018) and following Moriconi et al. (2018), we check the correlations between the instrument and the pre-1960 economic trends. Table C-6 in the Appendix shows the coefficients from regressing the growth of the predicted epidemiological term on the pre-1960 growth of GDP per capita (Panel A) and population (Panel B) over different time periods. None of the correlations are statistically significant. This is also the case when we regress the growth of our external IV on countries' legal origin (Panel C). This evidence suggests that our predicted epidemiological effect is not correlated with pre-existing national trends and therefore increases the validity of the instrument.[21]

III.C Testing for alternative immigration effects

Our benchmark specification explores the response of labor regulation due to immigration. Even though we test for the implications of the size and composition of the immigrant population, immigration is a complex phenomenon that can influence receiving countries in different ways through its effect on human capital, culture, productive knowledge, and other factors (Borjas, 2016). In this section, we try to take into account some alternative effects.

One of the strongest and also undoubted results of the migration literature is that several effects of immigration are skill specific: college-educated immigrants tend to be more beneficial to the destination countries' economy relative to less educated immigrants (Docquier et al., 2014; Borjas, 2019). Investigating the skill-specific effect of immigration on countries' labor regulation would be intriguing, also given the different interactions that less educated and highly educated immigrants have on the labor markets. However, the only source of data that provides skill-specific bilateral migration stocks for a wide set of destination countries is Artuç et al. (2014), which combines several censuses for only two years: 1990 and 2000. Having only two years' worth of data is insufficient for obtaining GMM estimates in our dynamic panel specification.[22] To account for the skill composition of immigrants and the potential self-selection on education, we then follow Alesina et al. (2016) and compute an index of immigrant

[20] The size of the Rotemberg weights proxy for the importance of each specific origin group. As suggested by Goldsmith-Pinkham et al. (2020), we report the top-five origin countries in terms of Rotemberg weights, which accounts for, on average, 40% of the total weights, which is not far from the results provided in the canonical migration setting (Goldsmith-Pinkham et al., 2020).

[21] Adao et al. (2019) point out that another source of bias could be driven by a correlation of the errors due to a similar initial distribution of immigrants by country of origin in destination countries. Countries with a similar initial historical distribution of immigrants by country of origin will suffer similar shocks, which will appear in a correlation in the standard errors. We do not think that this bias could affect our results. First, the two-step GMM estimator implemented in our analysis is robust to any pattern of heteroskedasticity and cross-correlation (Roodman, 2009). Second, we perform a correction in the spirit of Adao et al. (2019) by first dividing the sample of destination countries by different quantiles based on the initial share of immigrants coming from the top-origin countries identified by the Rotemberg Weights in Table C-4. Then we perform our system GMM analysis and cluster the standard errors over cells corresponding to the quantiles of the initial distribution of each of these shares. Table C-7 in the Appendix shows that standard errors associated with the epidemiological effect remain fairly similar across the different clustering, minimizing potential concerns arising from unobserved correlations in the standard errors.

[22] We also followed Bahar et al. (2020b) and combined Artuç et al. (2014) data with the Database on Immigrants in OECD Countries (DIOC), provided by the OECD, to expand the time dimension of the analysis for a subset of countries. Nevertheless, the total number of country-period observations was too small to obtain any reliable estimates.

population skill selection for each country d at year t as follows:

$$Skill\ Selection_{d,t} = \sum_{o} \frac{\frac{HS\ TM_{o,2000}}{TM_{o,2000}}}{\frac{HS\ NAT_{o,2000}}{NAT_{o,2000}}} * \frac{MIG_{o,d,t}}{\sum_{o} MIG_{o,d,t}} = \sum_{o} MigSel_{o,2000} * \overline{mig}_{o,d,t} \tag{8}$$

Using Artuç et al. (2014) and Barro and Lee (2013) data, we first compute, for each country of origin o in year 2000, the relative share of highly educated migrants abroad compared to highly educated natives in their origin countries' native population ($MigSel_{o,2000}$). If $MigSel_{o,2000}$ is above one, it means that for the specific country of origin o, the relative share of highly educated individuals abroad is higher than at the origin countries, suggesting positive selection on education. The selection index ($Skill\ Selection_{d,t}$) is then a weighted average of immigrants' relative self-selection on education, using the share of immigrants by origin as weights, and proxies for immigrants' level of self-selection on education.

One of the implications of international migration is its contribution to population diversity. Several studies find positive economic effects of migration diversity measures (mainly immigrants' birthplace diversity) on economic performance at different levels of aggregation (Ottaviano and Peri, 2006; Ortega and Peri, 2014; Trax et al., 2015; Alesina et al., 2016; Docquier et al., 2020). More recently, Bahar et al. (2020b) show in a cross-country analysis that this positive effect is due to the expansion of the productive knowledge of receiving countries. The increasing variety of competences and knowledge as a result of immigration can also have implications for labor regulation. To account for the potential response of labor regulation to migration diversity, we compute for each country of destination d an index of immigrant birthplace diversity as follows:

$$Diversity_{d,t} = \sum_{o} \overline{mig}_{o,d,t}(1 - \overline{mig}_{o,d,t}), \tag{9}$$

where $\overline{mig}_{o,d,t}$ is the share of immigrants from country of origin o over the total immigrant population in destination country d at year t. This index ranges between 0 and 1, and it measures the probability of randomly drawing two individuals born in different countries from the immigrant population. Including the immigrant birthplace diversity index in the main regression with the share of immigrants allows us to control for the size and the diversity of the immigrant population simultaneously.[23]

An alternative approach to account for the effect of immigration on the variety of the population is to compute a polarization index rather than a diversity index. Intuitively, a polarized population is less cohesive, which could affect social trust, public good provision, and potential conflict (Montalvo and Reynal-Querol, 2003, 2005; Ager and Brückner, 2013). Since the most polarized population is characterized by only two groups of equal size, it is intuitive to see polarization as the other side of the coin of diversity. We follow Montalvo and Reynal-Querol (2005) and compute an immigrants' birthplace polarization index as follows:

$$Polarization_{d,t} = 1 - \sum_{o} \left(\frac{0.5 - \overline{m}_{o,d,t}}{0.5} \right)^2 \overline{m}_{o,d,t}. \tag{10}$$

For each country of destination d and year t, the polarization index measures how much the immigrant population is close to a bimodal distribution: if it is equal to one, then the immigrant population is composed of only two groups

[23] Alesina et al. (2016) show that the immigration share and the birthplace diversity index computed for the total population (rather than for the immigrant population) are highly correlated. Including the immigration share and the birthplace diversity index computed over the immigrant population will account for both overall diversity and diversity within the immigrant population.

of equal size.

Finally, immigrants can bring with them their experience and habits not only of their labor regulation but also of other relevant aspects. In particular, immigrants coming from developing and poor countries can behave differently from immigrants coming from more developed countries in the labor market, since they experienced a different productive system. We then perform two alternative falsification tests to verify whether the epidemiological effect is driven by the labor regulation experienced by the immigrants and not by other factors. First, we compute an epidemiological effect as a weighted average of the GDP per capita at the origin rather than the WPI ($Epid\ GDP$). If the epidemiological effect is driven by any aspect related to the level of development of the origin countries, it should be captured by this term. Second, we compute an epidemiological effect after randomly assigning the level of WPI to the origin countries ($Epid\ ran$). Finally, our epidemiological effect is driven by the level of labor regulation in the origin countries and not by the difference between origin and destination country labor regulation. However, what could matter could be the distance between the legal systems, rather than the level. To test this potential alternative story, we compute an epidemiological effect using not the level of the WPI in the origin country, but rather a normalized Manhattan distance between the origin country and the destination country ($Epid\ dist$).[24] Destination countries characterized by immigrants from countries with similar labor law regulation should experience an extremely small $Epid\ dist$ value.

IV Results

The results are organized in two parts. In Section IV.A, we present our main results measuring the response of WPI to immigration. In Section IV.B, we examine the robustness of our main results by its various subsamples and to other alternative effects such as diversity, polarization, and skill selection of immigrants. Additionally, we explore the heterogeneity of our main results by countries' economic development and legal system.

IV.A Main Results

We estimate the baseline model of equation (3) with system GMM using external instruments (shift-share and gravity) for our two variables of interest. Our regression sample covers a panel of 70 countries with five-year periods, from 1970 to 2010. We keep the same number of observations across all specifications to maximize the comparability of results.[25] We start from a parsimonious specification in columns (1) and (2) of Table 2, in which we include the lag of the outcome variable and the two variables of interest separately. To avoid simultaneity bias due to "bad controls" (Angrist and Pischke, 2008), we then gradually include the control variables until we reach our main specification in column (6).

In our main results in Table 2, we find a positive and statistically significant effect of the epidemiological term capturing the composition of immigration on the WPI. The coefficient is stable to the inclusion of relevant controls. This result suggests that destination countries' labor regulation is responsive to the level of workers' protection that immigrants experience in their origin country. As for the size of migration, we find a null or negative effect that is

[24] The normalized Manhattan distance of WPI between origin country o and destination country d is computed as follows: $WPI^{MAN}_{o,d,2000} = \frac{|WPI_o - WPI_d|}{max_d|WPI_o - WPI_d|}$. It takes a value of 0 when country o and d have the same level of WPI, while it takes the value of 1 when country o and d have the highest distance over the whole sample of countries in analysis.

[25] Six missing country-period observations prevent us from achieving a balanced panel regression sample. This omission is due to the polity2 variable: there is one missing observation for Bangladesh and one for Qatar in 1970, and the other four observations are for Germany before its reunification from 1970 to 1985.

Table 2: Workers' Protection and Migration

	(1)	(2)	(3)	(4)	(5)	(6)
Estimation:	S-GMM	S-GMM	S-GMM	S-GMM	S-GMM	S-GMM
Time:	1970-2010	1970-2010	1970-2010	1970-2010	1970-2010	1970-2010
Dep var:	WPI	WPI	WPI	WPI	WPI	WPI
$Prot_{t-1}$	0.895***	0.854***	0.852***	0.860***	0.858***	0.847***
	(0.056)	(0.064)	(0.066)	(0.053)	(0.055)	(0.055)
$Share\ Mig_{t-1}$	-0.002		-0.003	-0.002	-0.005	-0.006*
	(0.002)		(0.002)	(0.003)	(0.003)	(0.003)
$Epid_{t-1}$		0.094**	0.094**	0.085**	0.085***	0.078***
		(0.041)	(0.040)	(0.034)	(0.030)	(0.028)
$ln(GDP)_{t-1}$				-0.009	0.031	0.054
				(0.048)	(0.045)	(0.058)
$Polity2_{t-1}$					-0.101	-0.012
					(0.107)	(0.100)
$ln(HC)_{t-1}$						-0.011
						(0.077)
Year FE	✓	✓	✓	✓	✓	✓
Country FE	✓	✓	✓	✓	✓	✓
AR1 p-val	0.00	0.00	0.00	0.00	0.00	0.00
AR2 p-val	0.57	0.57	0.57	0.56	0.50	0.55
Hansen p-val	0.37	0.41	0.40	0.55	0.74	0.78
Diff-Hansen p-val	0.27	0.59	0.38	0.90	0.88	0.83
Instruments	15	15	16	20	24	28
Countries	70	70	70	70	70	70
Observations	554	554	554	554	554	554

Note: Standard errors are clustered at the country level. * p<0.1, ** p<0.05, *** p<0.01. The dependent variable is our standardized workers' protection index. As controls, we include the logarithm of GDP per capita, the polity2 index, and the logarithm of human capital. Our main variables of interest are the share of immigrants and the epidemiological effect: the former is instrumented using the predicted immigration share from a gravity model and the latter with the epidemiological effect using predicted bilateral immigration stocks from a shift-share approach. See Appendix A for further information on the variables.

significant at a 10% level in our main specification (column 6), but it is not robust across other specifications. Hence, labor regulation does not seen responsive to the size of the immigrant population, also minimizing the concerns about positive reverse causation (i.e., immigrants attracted by protected labor markets). To gain some intuition into the economic magnitude of these effects, we take the face values of the benchmark estimates in column (6). An increase in the migration share by one standard deviation (around 10 percentage points) induces a 6% standard deviation decrease in the WPI over a five-year period. An increase in the epidemiological term by one standard deviation leads to a 7.8% standard deviation increase in the WPI in the destination country—a substantial effect. Our lag dependent variable, as expected, is highly significant across specifications with a coefficient above 0.8, confirming the high persistency of the WPI. We do not find any statistically significant effect associated with the gradually included controls: the level of development, human capital, and the degree of democratization.[26]

To assess the validity of our results, we perform all standard post-estimation test statistics. The first is the absence of a second-order serial correlation in the residuals, which we satisfy as AR(2) p-value is always greater than 0.1. For the Hansen J-test of overidentifying restrictions and the difference-in-Hansen tests, we never reject the null hypothesis, indicating that the moment conditions are satisfied and that the instruments are valid across the specifications. Additionally, we perform various tests for the validity of instruments following Bazzi and Clemens (2013), and in Table C-2 we test the weakness of instruments in both levels and differences; the Kleibergen-Paap F-stats are significantly greater than 10, and the Kleibergen-Paap Wald-type statistics indicate that we do not suffer

[26]One explanation for finding no effects in the additional controls is that we only use internal instruments to mitigate endogeneity problems. In an ideal case, we would instrument each of the additional controls with valid external instruments.

from a weak instrument problem.

IV.B Robustness and Heterogeneity

In Table 3 we perform robustness checks by subsamples, using different measures of the epidemiological term, and by testing the relevance of imputations. Using the benchmark specification presented in column (6) of Table 2, we first investigate whether our results are driven by a specific set of countries or years. In column (1), we remove the last two periods (corresponding to 10 years) of our sample to avoid potential spurious estimates due to the 2008 financial crisis and the inclusion of 2010 migration data from a different source compared to Özden et al. (2011). In columns (2) and (3), we drop countries belonging to the upper quantile of the migration share and workers' protection index accordingly.[27] This is to address the concern about potential outliers by removing the right tail of the variable distribution. In the second part, we test whether our results are being driven by imputations and different measures of the epidemiological term. In column (4), we run our analysis in 10-year periods to verify whether our results are being driven by the five-year interpolations made in the bilateral stocks of immigrants. In column (5), we drop from the sample countries characterized by a high percentage of imputed WPI within their epidemiological term (i.e., more than 30% of the immigrant population coming from a country with an imputed WPI). In the next three columns, we test the robustness of the epidemiological term with different imputation methods: (6) imputing the missing countries with the minimum value by legal origin ($Epid\ min$), (7) imputing the missing countries with the maximum value by legal origin ($Epid\ max$), and (8) not imputing the values of missing countries ($Epid\ strict$). In the last column, we test a specification that simultaneously does not use imputed values for the epidemiological and migration terms, by using $Epid\ strict$ and 10-year periods.

The estimated coefficient for the epidemiological term is always positive and highly significant across all subsamples and imputations. These estimates suggest that the positive effect of the epidemiological effect on WPI is not driven by particular outliers or imputation methods. Moreover, the magnitude of the coefficient is very stable, except for columns (4) and (9).[28] Apart from the Hansen test in column (9), all of our estimates satisfy the standard Hansen, difference-in-Hansen, and AR2 post-estimation tests. As for the estimated coefficient for the share of immigrants, it is not significant when looking at subsamples in columns (1) to (3) and in column (9). However, it is significant and negative when looking at robustness to imputations in columns (4) to (8). Therefore, the conclusion for the size of migration is in line with Table 2: the size of migration has a null or small and negative impact on the WPI.

After verifying that our results are not driven by sample selection and data imputations, we investigate whether alternative effects due to immigration could replace or complement our estimates. As Section III.C presents, the literature identifies that diversity and polarization of the immigrant population can have a direct effect on countries' productive knowledge and economic development (Ager and Brückner, 2013; Bahar et al., 2020b; Docquier et al., 2020). We include an index of diversity and an index of polarization among immigrants in columns (1) and (2) of Table 4, respectively. The estimates show that neither immigration diversity nor polarization outruns the epidemiological effect as a relevant channel for explaining WPI variation. Moreover, the estimates for both indexes are not statistically different from zero. To test whether our effects are not entirely driven by the absence of the skill composition and self-selection of immigrants, we follow Alesina et al. (2016) and include as additional control an index of immigrants' self-selection on education. Column (3) of Table 4 shows estimates that are similar to the

[27] In our sample, we removed 14 countries based on the values in the year 2000.

[28] Re-estimating our results over a longer time span (10-year periods rather than 5-year periods) may increase the variation and consequently the estimated coefficients; additionally, we reduce the sample size by half, which reduces the precision of the estimates.

Table 3: Workers' Protection and Migration - Robustness Checks

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Estimation:	S-GMM	S-GMM	S-GMM	S-GMM	S-GMM	S-GMM	S-GMM	S-GMM	S-GMM
Time:	1970-00	1970-10	1970-10	1970-10	1970-10	1970-10	1970-10	1970-10	1970-10
Dep var:	WPI	WPI	WPI	WPI	WPI	WPI	WPI	WPI	WPI
Robustness to:	2005-10	Top20%Mig	Top20%WPI	10-year	Epid imp	Epid min	Epid max	Epid stric	Epid stric &10-year
WPI_{t-1}	0.834***	0.777***	0.787***	0.792***	0.853***	0.849***	0.857***	0.846***	0.742***
	(0.047)	(0.074)	(0.074)	(0.113)	(0.059)	(0.054)	(0.055)	(0.055)	(0.154)
$Share\ Mig_{t-1}$	-0.001	0.007	-0.004	-0.024*	-0.008**	-0.006*	-0.006*	-0.006*	-0.026
	(0.004)	(0.012)	(0.004)	(0.013)	(0.004)	(0.003)	(0.003)	(0.004)	(0.017)
$Epid_{t-1}$	0.090***	0.074**	0.067**	0.137**	0.070**				
	(0.031)	(0.032)	(0.031)	(0.061)	(0.028)				
$Epid\ min_{t-1}$						0.073***			
						(0.026)			
$Epid\ max_{t-1}$							0.057**		
							(0.027)		
$Epid\ stric_{t-1}$								0.079***	0.304**
								(0.028)	(0.123)
Controls	✓	✓	✓	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓	✓	✓	✓
Country FE	✓	✓	✓	✓	✓	✓	✓	✓	✓
AR1 p-val	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AR2 p-val	0.58	0.37	0.55	0.57	0.51	0.56	0.53	0.55	0.55
Hansen p-val	0.74	0.81	0.63	0.10	0.84	0.80	0.76	0.79	0.09
DiffHansen p-val	0.54	0.90	0.73	0.48	0.81	0.80	0.84	0.83	0.47
Instruments	24	28	28	17	28	28	28	28	17
Countries	70	56	56	70	56	70	70	70	70
Observations	414	447	446	278	442	554	554	554	278

Note: Standard errors are clustered at the country level. * p<0.1, ** p<0.05, *** p<0.01. The dependent variable is our standardized workers' protection index. As controls, we include the logarithm of GDP per capita, the polity2 index, and the logarithm of human capital. Our main variables of interest are the share of immigrants and the epidemiological effect: the former is instrumented using the predicted immigration share from a gravity model and the latter with the epidemiological effect using predicted bilateral immigration stocks from a shift-share approach. See Appendix A for further information on the variables. Columns (1) to (5) report the estimates after dropping from the sample: the years 2005–2010 (col. 1), countries belonging to the top quintile in terms of share of immigrants (col. 2) and in terms of workers' protection index (col. 3), the five-year interpolated observations (col. 4), and countries with more than 30% of immigrants with imputed WPI at the origin. Columns (6) to (8) include as main variable of interest instead of the standard epidemiological effect: an epidemiological effect where all the imputed WPI measures at the origin are equal to the lowest value available ($Epid\ min$), an epidemiological effect where all the imputed WPI at the origin are equal to the highest value available ($Epid\ max$), and an epidemiological effect where missing values are not imputed ($Epid\ strict$). Column (9) reports results with no imputation in the epidemiological term and with 10-year periods.

baseline results associated with the epidemiological term and the migration share after including the self-selection index computed in equation (8); the coefficient associated with the index of self-selection is negative and smaller compared to the epidemiological term and only significant at the 10% level. To explore whether the epidemiological effect is influenced by the relative size of the immigrant population compared to the native population in the destination country, we replace in column (4) the standard epidemiological effect with one using as origin-specific weights the share of immigrants by origin over the destination country population ($Epid\ PopDe_{t-1}$). The estimates are consistent with our previous results, suggesting that the modified epidemiological term is not affected by the relative size of the immigrant population. Finally, column (5) presents the estimates using time-variant origin countries' workers' protection in the construction of the epidemiological effect. The estimated coefficient is similar in magnitude compared to the benchmark, with slightly smaller precision in the estimates.

To test whether the epidemiological effect is driven not only by the level of WPI experienced in the origin countries but also by the origin-destination distance in WPI, column (6) of Table 4 replaces our standard epidemiological effect with the one using WPI origin-destination distances rather than levels ($Epid\ dist$). We do not find a significant effect associated with the latter index, suggesting that the difference between the immigrants' and natives' WPI

Table 4: Workers' Protection and Migration - Alternative Immigration Effects and Falsification tests

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Estimation:	S-GMM	S-GMM	S-GMM	S-GMM	S-GMM	S-GMM	S-GMM	S-GMM
Time:	1970-2010	1970-2010	1970-2010	1970-2010	1970-2010	1970-2010	1970-2010	1970-2010
Dep var:	WPI	WPI	WPI	WPI	WPI	WPI	WPI	WPI
WPI_{t-1}	0.849***	0.853***	0.847***	0.865***	0.834***	0.869***	0.858***	0.868***
	(0.054)	(0.053)	(0.055)	(0.054)	(0.092)	(0.052)	(0.053)	(0.053)
$Share\ Mig_{t-1}$	-0.006*	-0.006*	-0.006*	-0.007	-0.005	-0.006*	-0.005	-0.006**
	(0.003)	(0.003)	(0.003)	(0.005)	(0.006)	(0.003)	(0.003)	(0.003)
$Epid_{t-1}$	0.079***	0.079***	0.072***					
	(0.028)	(0.029)	(0.027)					
$Diversity_{t-1}$	0.018							
	(0.030)							
$Polar\ Mig_{t-1}$		0.003						
		(0.030)						
$Selection_{t-1}$			-0.022*					
			(0.013)					
$Epid\ PopDe_{t-1}$				0.087**				
				(0.035)				
$Epid\ Tvar_{t-1}$					0.079**			
					(0.037)			
$Epid\ dist_{t-1}$						0.043		
						(0.590)		
$Epid\ GDP_{t-1}$							0.068	
							(0.049)	
$Epid\ ran_{t-1}$								-0.018
								(0.028)
Controls	✓	✓	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓	✓	✓
Country FE	✓	✓	✓	✓	✓	✓	✓	✓
AR1 p-val	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AR2 p-val	0.55	0.56	0.55	0.56	0.49	0.54	0.54	0.54
Hansen p-val	0.81	0.76	0.78	0.76	0.41	0.76	0.81	0.77
Diff-Hansen p-val	0.83	0.85	0.86	0.63	0.66	0.78	0.67	0.79
Instruments	29	29	29	28	28	28	28	28
Countries	70	70	70	70	70	70	70	70
Observations	554	554	554	554	554	554	554	554

Note: Standard errors are clustered at the country level. * p<0.1, ** p<0.05, *** p<0.01. The dependent variable is our standardized workers' protection index. As controls, we include the logarithm of GDP per capita, the polity2 index, and the logarithm of human capital. Our main variables of interest are the share of immigrants and the epidemiological effect: the former is instrumented using the predicted immigration share from a gravity model and the latter with the epidemiological effect using predicted bilateral immigration stocks from a shift-share approach. See Appendix A for further information on the variables. Columns (1) to (3) include as additional controls: birthplace diversity index among immigrants ($Diversity$), polarization index among immigrants ($Polarization$), and human capital selection index of immigrant population ($Skill\ Selection$). Columns (4) to (8) include as main variables of interest instead of the standard epidemiological effect: an epidemiological effect using as origin-specific weights the share of immigrants over the total population of the destination country ($Epid\ PopDe_{t-1}$), and epidemiological effect in which the WPI component is time-varying ($Epid\ Tvar_{t-1}$), an epidemiological effect based on the origin-destination WPI distances ($Epid\ dist$), an epidemiological effect using the level of GDP per capita at the origin as weight ($Epid\ GDP$), and an epidemiological effect where the WPI at the origin is randomly distributed ($Epid\ ran$). All the additional included variables are instrumented using predicted bilateral immigration stocks from a shift-share approach.

is far less important for the change in WPI at destination compared to the degree (level) of WPI that immigrants experienced in the origin country. Finally, since immigrants bring with them the origin-country experience of not only labor market regulation but also a broader set of competences and skills, we perform two falsification tests by building two different epidemiological effects based on immigrants' GDP at origin instead of WPI ($Epid\ GDP$) as well as completely randomizing the level of WPI in the origin countries ($Epid\ ran$). After replacing our main epidemiological effect with the two alternative constructions in columns (7) and (8) of Table 4, we confirm that the epidemiological effect is driven by the immigrants' origin-country experience of labor regulation.

Beyond the controls included in the benchmark specification, we test the robustness of our results by including additional controls in the appendix in Table D-1. First, we include a measure of de facto law proxied by the rule of

Table 5: Workers' Protection and Migration - Heterogeneity Analysis

	(1)	(2)	(3)	(4)
Estimation:	S-GMM	S-GMM	S-GMM	S-GMM
Time:	1970-2010	1970-2010	1970-2010	1970-2010
Dep var:	WPI	WPI	WPI	WPI
WPI_{t-1}	0.838***	0.831***	0.822***	0.819***
	(0.054)	(0.055)	(0.064)	(0.062)
$Share\ Mig_{t-1}$	-0.005	-0.005	-0.005	-0.006*
	(0.004)	(0.004)	(0.004)	(0.003)
$Epid_{t-1}$	0.078***	0.067**	0.055**	0.068**
	(0.029)	(0.029)	(0.026)	(0.028)
$Share\ Mig_{t-1} * OECD^{HIC}$	-0.004			
	(0.005)			
$Epid_{t-1} * OECD^{HIC}$		0.042		
		(0.051)		
$Share\ Mig_{t-1} * Common\ Law$			-0.004	
			(0.005)	
$Epid_{t-1} * Common\ Law$				-0.068
				(0.091)
$OECD^{HIC}$	0.177*	0.160**		
	(0.096)	(0.080)		
$Common\ Law$			-0.096	-0.164
			(0.077)	(0.100)
Controls	✓	✓	✓	✓
Year FE	✓	✓	✓	✓
Country FE	✓	✓	✓	✓
AR1 p-val	0.00	0.00	0.00	0.00
AR2 p-val	0.54	0.54	0.55	0.55
Hansen p-val	0.83	0.85	0.77	0.76
Diff-Hansen p-val	0.85	0.87	0.84	0.84
Instruments	30	30	30	30
Countries	70	70	70	70
Observations	554	554	554	554

Note: Standard errors are clustered at the country level. * p<0.1, ** p<0.05, *** p<0.01. The dependent variable is our standardized workers' protection index. As controls, we include the logarithm of GDP per capita, the polity2 index, and the logarithm of human capital. Our main variables of interest are the share of immigrants and the epidemiological effect: the former is instrumented using the predicted immigration share from a gravity model and the latter with the epidemiological effect using predicted bilateral immigration stocks from a shift-share approach. Additionally, we include dummies capturing the level of development and legal origin of destination countries. See Appendix A for further information on the variables.

law index, which can serve as a complementary variable to our de jure measure of the WPI (Coppedge et al., 2020). Next, we add a civil liberties index, which is a combination of de facto and de jure questions that are important for maintaining the rights of citizens (House, 2016). Third, we include a measure of the size of the informal market or the shadow economy, which could affect the size and the composition of immigrants as well as the degree of workers' protection (Elgin et al., 2012). Afterward, we include the economic freedom index and trade (exports plus imports) as a share of GDP (Gwartney et al., 2018; World Bank, 2018). Finally, we control for countries' membership in the European Union, the International Labor Organization (ILO), and the World Trade Organization (WTO). Overall, after including these additional controls separately, the coefficients of interest remain in line with our benchmark results.

In Table 5, we test for the heterogeneous response of the WPI to immigration across destination countries by looking at the level of development (measured by being a high-income OECD country) and at the legal origin. After including destination-specific dummies and interaction terms with our variables of interest, we do not find a differential impact depending on economic development or legal origin. Columns (2) and (4) reveal that what matters is immigrants' workers' protection at the origin country, regardless of the destination country's legal system

and level of economic development. Finally, looking at the main terms, we confirm the stylized facts in Figure 2: high-income OECD countries and civil law countries are characterized by a higher level of WPI (although such difference in levels is not significant for the legal origin). Legal origin seems to better explain the cross-sectional variation rather than the within-country evolution over time.[29]

V Mechanisms

In this section, we explore the few potential mechanisms via which the WPI responds to immigrants' experience of origin-specific labor regulation. In Section V.A, we decompose our dependent variable into its five main subcomponents to better identify which dimension of WPI is the most responsive to immigration. In Section V.B, we describe a stylized theory to rationalize the changes in labor regulation due to immigration by exploring the implications for unions' bargaining power and political actors. Section V.C provides empirical suggestive evidence of the stylized theory.

V.A WPI Subcomponents

As mentioned in Section II.A, our workers' protection index is a synthetic index based on different indicators covering separated areas of labor regulation. We perform such aggregation to capture the general reaction of labor regulation to immigration. Nonetheless, Table 6 presents the estimates of the response of the five subdimensions of the WPI to immigration: (i) industrial action laws ($IndAction$), (ii) worker representation laws ($WkrRepr$), (iii) worker dismissal laws ($WkrDismis$), (iv) working time laws ($WorkTime$), and (v) employment forms laws ($EmptForm$). Each specification includes the same set of controls and variables of interest as our benchmark specification. Even though the variation of each subcomponent over time is smaller than the overall WPI, we find that the level of workers' protection that immigrants experienced in their origin countries (and proxied by the epidemiological effect) has a positive and statistically significant effect on two subcomponents: worker representation laws and employment forms laws. Both coefficients are statistically significant at the 5% level, and the magnitude of the effect is similar to the aggregate WPI. The estimates associated with the size of immigration are small and close to zero. These areas of labor regulation have important implications for the labor market. Worker representation laws, such as unionization and collective bargaining rights, are extremely relevant because of their direct impact on wage dispersion: a broad set of evidence shows that unions reduce wage dispersion, in particular for male workers (Lemieux, 1998; Card et al., 2004, 2020). Moreover, the degree of rigidity of the employment forms not only has a general effect on wages and employment but also influences how natives react to a supply shock in the workforce as a result of immigration flows (D'Amuri and Peri, 2014; Edo, 2016).

To capture whether the estimates are driven by immigrants' experience of the specific area of labor law regulation, in Table 7 we recalculate the epidemiological term by replacing the immigrants' aggregate level of workers' protection at origin with one of the five WPI subcomponents at a time. Then we estimate the subcomponent-specific epidemiological effect on the same destination country subcomponent of workers' protection. For instance, in column (2), we see that the epidemiological term constructed with immigrants' worker representation laws at origin ($Epid^{WkrRepr}$) affects the worker representation laws in the destination country. The magnitude of the effect is reduced from 7% to 5.9% standard deviations compared to the aggregate epidemiological effect presented in Table 6,

[29] Table D-2 in the Appendix shows the cross-sectional determinants in our sample of countries (average between 1970 and 2010). The legal origin seems to explain a large portion of WPI disparities across countries.

Table 6: WPI Subcomponents and Migration

	(1)	(2)	(3)	(4)	(5)
Estimation:	S-GMM	S-GMM	S-GMM	S-GMM	S-GMM
Time:	1970-2010	1970-2010	1970-2010	1970-2010	1970-2010
Dep var: WPI Sub-component	$IndAction$	$WkrRepr$	$WkrDismis$	$WorkTime$	$EmptForm$
Dep_{t-1}	0.885***	0.894***	0.817***	0.903***	0.922***
	(0.082)	(0.044)	(0.070)	(0.059)	(0.061)
$Share\ Mig_{t-1}$	-0.010	-0.002	0.004	-0.000	-0.005
	(0.007)	(0.004)	(0.005)	(0.003)	(0.004)
$Epid_{t-1}$	-0.030	0.070**	0.044	0.031	0.061**
	(0.034)	(0.030)	(0.038)	(0.028)	(0.031)
Controls	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓
Country FE	✓	✓	✓	✓	✓
AR1 p-val	0.00	0.00	0.00	0.00	0.00
AR2 p-val	0.69	0.79	0.39	0.11	0.86
Hansen p-val	0.89	0.50	0.54	0.57	0.34
Diff-Hansen p-val	0.83	0.39	0.37	0.53	0.36
Instruments	28	28	28	28	28
Countries	70	70	70	70	70
Observations	554	554	554	554	554

Note: Standard errors are clustered at the country level. * p<0.1, ** p<0.05, *** p<0.01. Each column has as a dependent variable a different subcomponent of the workers' protection index: industrial action and striking ($IndAction$), employment representation and unionization ($WkrRepr$), workers' dismissal regulation ($WkrDismis$), working time regulation ($WorkTime$), and employment relationship and employment forms ($EmptForm$). As controls, we include the logarithm of GDP per capita, the polity2 index, and the logarithm of human capital. Our main variables of interest are the share of immigrants and the epidemiological effect: the former is instrumented using the predicted immigration share from a gravity model and the latter with the epidemiological effect using predicted bilateral immigration stocks from a shift-share approach. See Appendix A for further information on the variables.

and the significance level remains unchanged. We also find a similar magnitude of the effect for the subcomponent-specific epidemiological effect ($Epid^{EmptForm}$) in column (5), which is now significant only at the 10% level. We do not find any significant estimates associated with either the epidemiological effect or the share of immigrants on the other three dimensions (industrial action laws, worker dismissal laws, and working time laws). It is worth noting, however, that the tested subcomponents exhibit lower variation over time compared to the full index, and we are capturing a lot of variation in our demanding specification with the persistency term included. Overall, our results show that some areas of the labor law regulation are more likely to react to immigration, in particular, laws concerning labor unions' rights.

V.B A Stylized Theory of Unions' Bargaining Power

The previous set of results shows that there is heterogeneity in the response of the different areas of labor regulation to immigration. The laws concerning workers' rights to unionize and unions' power to bargain for wages appear to be particularly responsive to variations in the composition of the immigrant population. In this section, we want to provide some theoretical arguments behind these results by first distinguishing the *direct effect* from the *indirect effect* of immigration on labor law regulation.

A *direct effect* on the legislators can occur as a result of immigrants' participation in the political system through voting. If immigrants have the right to vote, they could, for instance, vote for parties that support a degree of workers' protection that is similar to what they experienced in their origin countries. Then, a higher epidemiological term captures a higher support for parties with a focus on more protective labor regulation. In a sample of 32 European countries, Luttmer and Singhal (2011) show that immigrants who share stronger origin-specific preferences toward

Table 7: WPI Subcomponents and Migration - Subcomponent-Specific Epidemiological Term

	(1)	(2)	(3)	(4)	(5)
Estimation:	S-GMM	S-GMM	S-GMM	S-GMM	S-GMM
Time:	1970-2010	1970-2010	1970-2010	1970-2010	1970-2010
Dep var: WPI Sub-component	$IndAction$	$WkrRepr$	$WkrDismis$	$WorkTime$	$EmptForm$
Dep_{t-1}	0.877***	0.900***	0.820***	0.884***	0.924***
	(0.086)	(0.045)	(0.067)	(0.069)	(0.055)
$Share\ Mig_{t-1}$	-0.011	-0.002	0.004	-0.000	-0.004
	(0.007)	(0.003)	(0.004)	(0.003)	(0.004)
$Epid_{t-1}^{IndAction}$	-0.017				
	(0.043)				
$Epid_{t-1}^{WkrRepr}$		0.059**			
		(0.029)			
$Epid_{t-1}^{WkrDismis}$			0.035		
			(0.035)		
$Epid_{t-1}^{WorkTime}$				0.057	
				(0.037)	
$Epid_{t-1}^{EmptForm}$					0.052*
					(0.027)
Controls	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓
Country FE	✓	✓	✓	✓	✓
AR1 p-val	0.00	0.00	0.00	0.00	0.00
AR2 p-val	0.70	0.81	0.38	0.10	0.86
Hansen p-val	0.90	0.55	0.54	0.55	0.35
Diff-Hansen p-val	0.84	0.37	0.35	0.50	0.38
Instruments	28	28	28	28	28
Countries	70	70	70	70	70
Observations	554	554	554	554	554

Note: Standard errors are clustered at the country level. * p<0.1, ** p<0.05, *** p<0.01. Each column has as a dependent variable a different subcomponent of the workers' protection index: industrial action and striking ($IndAction$), employment representation and unionization ($WkrRepr$), workers' dismissal regulation ($WkrDismis$), working time regulation ($WorkTime$), and employment relationship and employment forms ($EmptForm$). As controls, we include the logarithm of GDP per capita, the polity2 index, and the logarithm of human capital. Our main variables of interest are the share of immigrants and the subcomponent-specific epidemiological effect: the former is instrumented using the predicted immigration share from a gravity model and the latter with the epidemiological effect using predicted bilateral immigration stocks from a shift-share approach. See Appendix A for further information on the variables.

redistribution are more prone to support and vote for redistributive parties. However, since only a small share of immigrants obtain voting rights after a long period of residence in a subset of destination countries in our sample, this potential direct effect is expected to be small. Alternatively, another direct effect could appear as a result of interaction between immigrants and local households. Giuliano and Tabellini (2020) suggest that US natives' exposure to more welfare-state-oriented European immigrants have influenced natives' political preferences toward redistribution. Although the interaction between households holding different preferences and views might play an important role, we are unable to test for direct interactions between natives and migrants in our framework.

Alternatively, labor law regulation's reaction can be rationalized by an *indirect effect* of immigration on workers' protection. By participating in the labor market, immigrants can influence both the supply of labor and the bargaining power of different actors in the labor market, particularly through immigrants' participation in trade unions. If immigrant workers' propensity to unionize differs from that of natives, unions' bargaining power may be affected: unions that represent a bigger (smaller) share of the labor force have stronger (weaker) bargaining power (Mishel, 1986). Moreover, if political actors (i.e., parties) react to changes in union density and unions' bargaining power, then immigration could contribute to changes in labor law regulation.

To rationalize our arguments and the hypotheses that we want to test concerning the indirect effect, we can first

describe a stylized theory of unions' bargaining power (BP^u). The degree of unions' bargaining power influences the economic gains for union members (i.e., the union wage premium) and for the society as a whole, by reducing wage dispersion (Card et al., 2020). For our purposes, we can describe it as a function of two factors: (i) union density (u^d) (i.e., the share of unionized employees over the employed population) and (ii) unions' supportive labor law regulation (l^u):

$$BP^u = F(u^d, l^u). \tag{11}$$

Higher union density implies that unions are able to represent a wider share of the employed population; hence, they would hold stronger bargaining power once they face employers and firms ($\frac{\delta BP^u}{\delta u^d} > 0$). Similarly, a more protective labor law regulation toward unions would positively influence unions' bargaining power ($\frac{\delta BP^u}{\delta l^u} > 0$). The literature shows that, although negatively affected by the rise of more competitive markets and unions' difficulties in monopolizing the supply of labor, unions' bargaining power is still strong enough (that is, sufficient above a certain threshold $BP^u > \widetilde{BP^u}$) to generate a union wage premium and reduce discrimination in labor markets (Bryson, 2014).

How can immigration influence unions' bargaining power? We can first formalize that the workforce is composed of natives (n) and immigrants (m), and we can define workers' propensity to unionize as p^i. If immigrants hold a different propensity to unionize compared to natives (i.e., $p^n \neq p^m$) and such propensity is related to immigrants' origin-country labor regulation experience, then changes in the composition of the immigrant population could affect unions' bargaining power.[30].

Our hypothesis is that origin-country labor regulation experience may influence immigrants' propensity to unionize. Defining as l_o the labor law regulation experienced in country of origin o, we can describe two potential implications for immigrants' propensity to unionize. Immigrants used to weak labor protection may be prone to seek protection in destination countries, thereby enhancing the propensity to unionize ($\frac{\delta p_o^m}{\delta l_o} < 0$), and conversely, immigrants used to strong labor protection may not be prone to seek protection in destination countries, thus diminishing the propensity to unionize. We define this behavior as a *responsive position* toward the origin-specific labor regulation experience. On the other hand, immigrants may stick to their origin-country experience: seeking protection if they experienced strong and effective labor regulation, and renouncing union protection if they experienced a weakly regulated labor market. We define this second behavior of immigrants as a *passive position* toward the origin country's labor regulation. Testing how origin-specific experience affects immigrants' union density would be the first step of our indirect effect analysis.

After describing how immigration can influence unions' bargaining power through union density, we can rationalize how legislators could react to a change in unions' bargaining power. Relying on Botero et al. (2004), we can identify two theories that could explain political actors' (i.e., parties) position toward unions and labor law regulation after variations in union density. The *political power theory* claims that changes in the law are driven by the political gains from potential voters: if unions become stronger and bigger, parties will promote legal changes to increase their bargaining power (i.e., more protective labor law) to obtain their support during elections. Alternatively, the *efficiency theory* argues that changes in the regulations are driven by efficiency considerations (i.e., to maximize social welfare). By defining an optimal level of union bargaining power ($\widehat{BP^u} > \widetilde{BP^u}$), political actors

[30]Combining the World Values Survey (WVS) longitudinal data from 1993 and the European Social Survey (ESS) data from 2000, Figure A-1 in the Appendix shows that immigrants are less unionized than natives: on average, only 8% (WVS) or 12.2% (ESS) of the immigrant workforce is unionized, compared to 9.8% (WVS) or 16.3% (ESS) of the native workforce. This discrepancy in union density is in line with the literature on European and Nordic European countries (Kranendonk and De Beer, 2016; Hagen and Jensen, 2019)

will counterbalance any variation above or below such optimal level with changes in labor law regulation in the opposite direction.

The next section provides suggestive evidence of the above-described stylized theory, testing (i) the relation between immigrants' origin-specific experience and union density, and (ii) the relation between union density and parties' political preferences.

V.C Testing the theory

The first step in our analysis is to test the relation between the degree of workers' protection that immigrants experience in their origin countries (captured by the epidemiological term) and their degree of unionization. To retrieve information on immigrants' unionization preferences, we rely on the European Social Survey (ESS), which provides information on both migration status (native or immigrant) and whether respondents belong to a trade union.[31] Our focus is on 14 European countries that are part of our initial sample and for which we have multiple observations over the period 2000–2010 in order to partially overlap our period of analysis starting from the first wave available from the ESS (2000). We drop the waves in which immigrants are just a small minority of the respondents (i.e., less than 80 observations). After computing the share of unionized workers at the country level, we estimate the partial correlation between the share of unionized workers and immigration. Our analysis includes both country and year fixed effects in order to capture time-invariant unobserved factors and common trends.

Table 8: Participation in Unions

	(1)	(2)	(3)	(4)	(5)	(6)
Estimation:	OLS	OLS	OLS	OLS	OLS	OLS
Time:	2000-2010	2000-2010	2000-2010	2000-2010	2000-2010	2000-2010
Dep var: $\frac{Unionized}{Workers}$	All	Natives	Migrants	All	Natives	Migrants
$Share\ Mig_t$	0.063	-0.125	0.189**	-0.135	-0.199	0.065
	(0.343)	(0.306)	(0.086)	(0.190)	(0.177)	(0.052)
$Epid_t$	-0.150	-0.039	-0.111***			
	(0.171)	(0.146)	(0.034)			
$Epid_t^{WkrRepr}$				-0.047	0.068	-0.115**
				(0.191)	(0.158)	(0.041)
Observations	38	38	38	38	38	38
Countries	14	14	14	14	14	14
Adj. R-Square	0.98	0.98	0.92	0.98	0.98	0.90
Country FE	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓

Note: Authors' calculations on ESS data. * p<0.1, ** p<0.05, *** p<0.01. Standard errors are clustered at the country level. Our main variables of interest are the share of immigrants and the epidemiological effect (computed with the overall WPI at the origin and the $WkrRepr$ specific subcomponent). The dependent variable is the overall share of unionized workers (col. (1) and (4)), the share of native unionized workers (col. (2) and (5)), and the share of immmigrant unionized workers (col. (3) and (6)) over the overall worker population. The sample of countries includes Austria, Belgium, Denmark, France, Germany, Greece, Ireland, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and United Kingdom. Waves of the survey are dropped when the size of the immigrant population is not well represented (i.e., less than 80 observations).

Table 8 shows the estimates using as a dependent variable the overall share of unionized workers (col. (1) and (4)), its decomposition between unionized native workers (col. (2) and (5)), and unionized immigrant workers (col. (3) and (6)) over the total employed population. Immigration (in terms of both size and composition) is not correlated with either the overall or native share of unionized workers. In column (3), the size of immigration

[31] An alternative dataset that can be used to retrieve information on immigrants' participation in unions is the World Values Survey; however, it is available for only a few countries that belong to our sample of countries over multiple periods.

is positively related to the share of unionized immigrants: by construction, having more immigrants increases the probability of having more unionized immigrants. Concerning the composition of the immigrant population, column (3) presents a negative relation between the epidemiological term and the share of unionized workers. Being aware that these estimates are suggestive partial correlations,[32] these results suggest a *responsive position* of immigrants after experiencing origin-country labor regulation: immigrants that are used to less protective labor regulation tend to seek protection from unions, and so they are more unionized. This intuition is somewhat confirmed in column (6), when we estimate the partial correlations between the share of unionized immigrants and the epidemiological term using the workers' employment representation subcomponent. This finding is in line with Table 7, where a higher share of immigrants coming from countries with strong unionization rights is negatively related to the share of unionized immigrant workers.

Table 8 estimates suggest that an immigrant population that is used to strong labor regulation in their origin countries tend to be less unionized. Consequently, the share of workers represented by unions is affected by immigrants' origin experience, which eventually influences their bargaining power. These effects can affect labor regulation (i.e., law-in-the-books) if parties react to such variation in union size by either proposing laws in line with the potential electoral gains from the pool of unionized workers or proposing laws to balance out the bargaining power of unions. The first reaction is in line with the *political power theory*, which predicts a positive relation between union density and parties' support of protective labor law, while the second reaction can be explained by an *efficiency theory*, which predicts a negative relation between union density and parties' support of protective labor law (Botero et al., 2004).

Table 9: Unions and Party Position Toward Labor Groups

	(1)	(2)	(3)	(4)	(5)	(6)
Estimation:	OLS	OLS	OLS	OLS	OLS	OLS
Time:	2000-2010	2000-2010	2000-2010	2000-2010	2000-2010	2000-2010
Dep var: Political Pref.	Lab. Groups	Lab. Groups	Lab. Groups	Lab. Groups	Lab. Groups	Lab. Groups
$Unions_{tot}$	-0.354*			-0.370**		
	(0.180)			(0.153)		
$Unions_{nat}$		-0.404**			-0.413**	
		(0.173)			(0.159)	
$Unions_{mig}$			-0.749			-1.106
			(0.781)			(0.797)
$Share\ Mig_t$				0.030	-0.034	0.222
				(0.224)	(0.241)	(0.230)
$Epid_t$				-4.791	-1.314	-11.458
				(9.358)	(10.262)	(10.877)
Observations	505	505	505	505	505	505
Countries	14	14	14	14	14	14
Adj. R-Square	0.37	0.37	0.34	0.37	0.36	0.34
Party FE	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓

Note: Authors' calculations on ESS and Manifesto Project Database (MPD) data. * p<0.1, ** p<0.05, *** p<0.01. Standard errors are clustered at the country level. The dependent variable is the net positive position of parties toward labor groups. Each party is weighted with the share of votes obtained in the election. The main variable of interest is the share of unionized workers. The sample of countries includes Austria, Belgium, Denmark, France, Germany, Greece, Ireland, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and United Kingdom. Waves of the survey are dropped when the size of the immigrant population is not well represented (i.e., less than 80 observations).

[32]For such a small set of countries and the short time span, our IV approaches produce weak instruments, generating unreliable estimates. Results are available upon request.

To test this potential relationship between union size and parties' political preferences, we use the Manifesto Project Database (MPD) (Volkens et al., 2019), which explores parties' political platforms through a content analysis of their political manifesto. For each party that won at least one seat in a national election, the MPD data quantify the party's political preferences by counting the number of quasi-sentences related to a specific political issue over the total length of the political manifesto.[33] For our purpose, we focus on parties' political preferences on labor groups: this measure captures parties' preferences toward the working class, labor unions, unemployed workers, and labor groups in general. Since MPD provides for each party the measure for the share of both positive and negative sentences toward labor groups, we built a measure of parties' net political preferences by subtracting the share of negative mentions from the share of positive mentions. We then explore over the same sample of countries and period in Table 8 the partial correlation between the share of unionized workers (overall, natives and immigrants) and parties' net political preferences toward labor groups. In our linear regression, we include year and party fixed effects in order to capture common trends and the time-invariant ideological position of the parties, and we weight each party for the share of votes gained in each electoral event.

Table 9 shows that the share of the unionized workforce is negatively related to parties' net favorable position toward labor groups. Although not statistically significant, the point estimates associated with the unionized migration workforce are the biggest. The estimates are robust in terms of magnitude and significance after controlling for the size and composition of the immigrant population. Recalling that these estimates should be interpreted cautiously because of the endogenous nature of the variables, we note that the direction of the relation is against the explanation of the *political power theory*: a reduction in the unionized workforce (i.e., a reduction in union bargaining power) fosters parties' favorable net position toward labor groups and unions. That would imply, from a legal point of view, a stronger and favorable regulation toward unions, which would balance out the reduction in union bargaining power, in line with the *efficiency theory*.

VI Discussion

Our analysis provides new insights into the response of workers' protection regulation to immigration: we find that the level of workers' protection that immigrants experience in their origin countries influences the evolution of labor regulation in the destination country. This finding is particularly relevant for workers' representation laws and employment forms laws. In this section, we provide some back-of-the-envelope calculations based on our estimates to have a sense of the magnitude of the WPI response to immigration. Even though these simulations have a descriptive purpose, since they cannot consider all general equilibrium effects, they can provide an intuitive picture of the magnitude of the reaction under various assumptions. Moreover, these simulations do not aim to explain the whole evolution of WPI presented in Figure 2, which is determined by many factors, but rather to attempt to highlight the contribution in a partial equilibrium of immigration on the evolution of WPI.

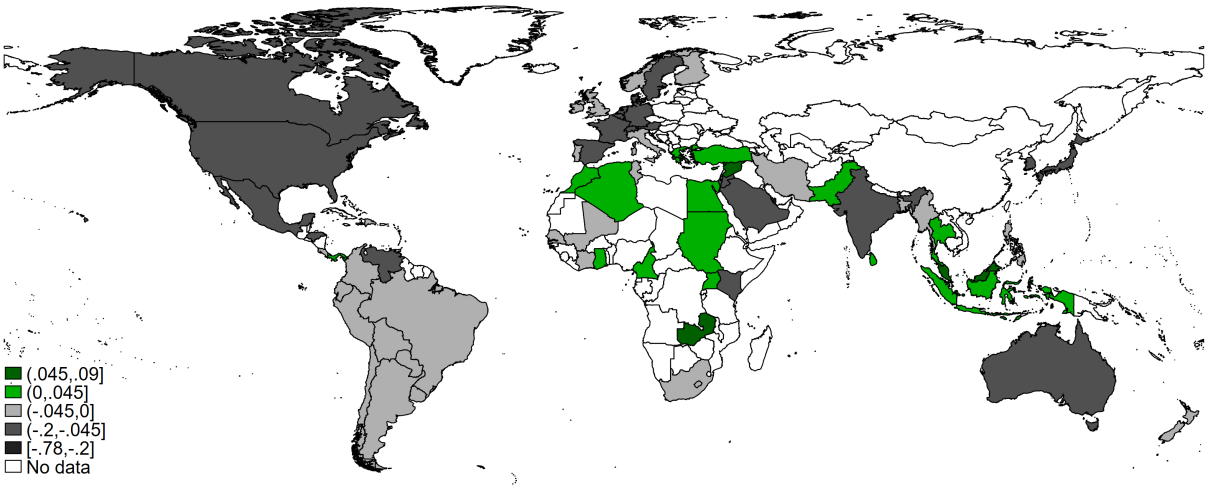
We first compute the observed long-run differences between two time periods (1970 and 2005) in the share of immigrants and in the epidemiological term. Then, using the estimated coefficients $\hat{\gamma}$ and $\hat{\delta}$ of our benchmark model (Table 2, column (6)), we compute the country-specific predicted variation in the WPI over the 1975–2010 period as follows:

[33] Although being a proxy of parties' political platforms, measuring parties' political preferences through a content analysis of the political manifesto has been shown to be a good proxy for parties' ideological spectrum. Focusing on issues related to nationalism, Moriconi et al. (2018) show that proxies with MPD data are closely related to other available data sources, such as the Chapel Hill Expert Survey.

$$\Delta\widehat{WPI}_{d,75-10} = \hat{\gamma}\Delta ShareMig_{d,70-05} + \hat{\delta}\Delta Epid_{d,70-05} \tag{12}$$

Figure 8 plots the results and shows a large degree of heterogeneity in the predicted variation for our sample of countries. The general pattern shows a negative WPI reaction to immigration in high-income OECD societies. This effect is explained both by the increase in the share of immigrants and by receiving immigrants from less regulated labor markets. Greece is the only exception, where the negative effect of the increase in the share of immigrants is counteracted by a positive effect from immigrants coming from countries with high levels of WPI. Concerning developing countries, the results are much more heterogeneous: African and Middle Eastern countries experienced, on average, a predicted increase of WPI as a result of immigration, whereas almost all Latin American countries experienced a predicted negative change.

Figure 8: WPI Simulation based on 1975-2010 variation



Note: Authors' calculations on CBR Leximetric data and World Bank data. The figure plots the predicted variation in our standardized measure of workers' protection due to migration. Predictions are based on equation (12).

To provide an idea of the aggregate effect, column (1) of Table 10 provides the predicted average WPI response to immigration for the standard scenario presented in Figure 8 and other four different scenarios, characterized by the following: (i) countries' epidemiological effect increased by 20% (Epid (+20%)); (ii) all the countries in our sample experienced the same variation in the epidemiological effect of the UK (Epid (UK)); (iii) all the countries in our sample experienced the same variation in the epidemiological effect of France (Epid (FR)); and (iv) countries experienced a variation in both the immigration share and the epidemiological effect following their 2000–2010 trend (Constant trends). We take France and the United Kingdom as two representative countries that are similar in terms of population and economic development while being geographically close, but significantly different in terms of their legal system (different levels of labor regulation) and immigration patterns. Although both countries experienced a sizeable increase in the share of immigrants during the analyzed period, the composition of the immigrant population was rather different: France attracted mainly immigrants from low WPI countries, producing a negative variation of -0.73 in the epidemiological effect, while the UK experienced a surge of immigrants from more regulated labor markets (increase of 0.16 in the epidemiological effect). Finally, to take into account the differences between the levels of development, the table shows the results for the whole sample (Panel A), for

OECD high-income countries (Panel B), and for non-OECD countries (Panel C).

Table 10: WPI and Labor Market Outcomes Simulations

Scenarios:	(1) $\Delta\overline{WPI}$	(2) $\Delta\overline{Unemp}$	(3) $\Delta\overline{Prod}$	(4) $\Delta\overline{Hrs}$	(5) $\Delta\overline{Gini}$
Panel A - All Countries					
Standard	-0.0425	-0.0872	-0.2107	2.0291	0.0004
Epid (+20%)	-0.0367	-0.0753	-0.1819	1.7515	0.0004
Epid (UK)	-0.0247	-0.0507	-0.1224	1.1786	0.0002
Epid (FR)	-0.0943	-0.1934	-0.4673	4.5007	0.0009
Constant trends	-0.0817	-0.1677	-0.4053	3.9027	0.0008
Panel B - OECD^{HIC}					
Standard	-0.0587	-0.1205	-0.2912	2.8047	0.0006
Epid (+20%)	-0.0520	-0.1066	-0.2576	2.4805	0.0005
Epid (UK)	-0.0341	-0.0701	-0.1693	1.6304	0.0003
Epid (FR)	-0.1037	-0.2128	-0.5143	4.9525	0.0010
Constant trends	-0.0980	-0.2011	-0.4858	4.6783	0.0010
Panel C - Non-OECD^{HIC}					
Standard	-0.0340	-0.0698	-0.1687	1.6245	0.0003
Epid (+20%)	-0.0287	-0.0589	-0.1424	1.3711	0.0003
Epid (UK)	-0.0197	-0.0405	-0.0979	0.9429	0.0002
Epid (FR)	-0.0893	-0.1833	-0.4429	4.2650	0.0009
Constant trends	-0.0733	-0.1503	-0.3632	3.4981	0.0007

Note: Authors' calculations on World Bank and CBR Leximetrics data. Column (1) shows the average country variation in workers' protection due to migration over the 1975–2010 period. Columns (2) to (5) show the average country variation in different labor market outcomes due to the variation in workers' protection. Each row presents a different scenario: (i) "Standard" shows the average country variation as presented in equation (12); (ii) "Epid (+20%)" shows the average country variation after an increase in the epidemiological term in each country by 20%; (iii) "Epid (UK)" shows the average country variation if all the countries have the same variation in the epidemiological term of the United Kingdom; (iv) "Epid (FR)" shows the average country variation if all the countries have the same variation in the epidemiological term of France; (v) "Constant trends" shows the average country variation if all the countries have an increase in the epidemiological term and migration share as the 2010–2000 trend. Panel A presents the results for the whole sample of countries in our analysis, while Panel B and Panel C show the estimates for OECD high-income countries and non-OECD high-income countries, respectively.

The standard scenario provides an average decrease in the workers' protection index by 4.2% of WPI standard deviations. Since the variation in the WPI over the period 1970–2010 is around one standard deviation (see Figure 2), the predicted effect is small albeit not negligible. The effects of immigration are smaller once countries experience an increase in their epidemiological effect (by receiving more immigrants from countries with high levels of WPI) or experience the same positive variation in the epidemiological term of the UK. On the other hand, experiencing the same change in the composition of immigrants between 1970 and 2005 as France, or assuming that the same recent trends as in 2000–2010 will persist in the future, generates even more negative effects. The predicted effects are even more negative for OECD countries compared to non-OECD in the standard scenario: the predicted WPI decrease in OECD countries is around 5.8% standard deviations, compared to the prediction of 3.4% for non-OECD countries.

What would be the economic implications of these predicted effects on the labor market? We compute the potential effect of the predicted WPI change by multiplying the predicted variation in WPI with the estimated coefficients associated with each labor market outcome presented in Table 1. The results are presented in columns (2) to (5) of Table 10, and each column shows the predicted effect of the variation in WPI resulting from migration on the variation in the unemployment rate (col. 2), labor productivity per hours worked (col. 3), annual hours worked per worker (col. 4), and the Gini index after tax (col. 5). In the standard scenario, the predicted reduction in WPI over the 1975–2010 period resulting from immigration should lead to a reduction in the unemployment rate of around 0.09 percentage points, a decrease in labor productivity per hours worked by 0.21, increase of 2.02

hours worked per worker in a year, and an increase of the Gini index by 0.04 percentage points.[34] The predictions almost double when we assume a constant trend in the migration variables. Finally, the economic predictions in OECD countries are twice as large as the ones in non-OECD countries. Being aware that these values have a mere descriptive purpose and should not overemphasized, we note that these results aim to provide intuitive magnitudes of the non-negligible economic implications of WPI changes resulting from immigration.

VII Conclusions

Mainly focusing on outcomes such as wages and employment, researchers have made an extensive effort to understand the impact of immigration on natives' labor market outcomes. The mixed set of evidence based on different methodological assumptions and datasets converges toward an overall growing consensus that the effect of immigration, on average, is small or null and that labor market institutions play an important role in the process of shaping natives' reactions to the inflow of immigrants in the labor market. In these studies, labor regulations are assumed to be exogenous to the presence of immigrants—but is this the case?

This paper answers this question by using a comprehensive dataset on labor law regulation, covering 40 years for 70 countries around the world. We build a novel measure of workers' protection based on 36 different aspects of labor law regulation and explore the reaction of labor regulation to immigration, in terms of both size and composition. The paper shows that workers' protection is responsive to immigrants' experience of workers' protection in their origin country. Namely, receiving immigrants from countries with high levels of workers' protection increases the level of workers' protection, and conversely, receiving immigrants from countries with low levels of workers' protection decreases the workers' protection in the destination country. As for the size of immigration, we find that it has a small negative or null effect on the workers' protection in destination countries. These results are robust after controlling for other competing or complementary effects of immigration, such as diversity, polarization, and skill selection. Moreover, the paper shows that the origin-specific effect is not driven by immigrants' experience of the economic situation in the origin country or by the relative distance between workers' protection in the origin and destination countries, but only by the level of workers' protection in the origin country.

Across different domains of the regulation, we find that worker representation laws and employment forms laws are the ones that are mostly influenced by immigration. Moreover, we provide suggestive evidence of immigrants' participation in unions as one of the potential mechanisms explaining the results: countries characterized by a higher share of immigrants from countries with high levels of workers' protection are associated with a lower share of unionized immigrant workers. We argue that this correlation could suggest that immigrants with high levels of workers' protection in the origin country are less prone to seek union protection in the destination country. The paper shows that changes in unions' capacity to represent the workforce are related to political parties' position toward labor groups, which may ultimately influence the evolution of labor law.

Lastly, we discuss the magnitude of the workers' protection response to immigration with back-of-the-envelope computations. Being aware of the partial nature of this exercise, we note that the results show that, on average, immigration contributes to a reduction in WPI of 4.2% standard deviations over the 1970–2010 period. The negative effects are 72% stronger in high-income OECD countries compared to non-OECD countries.

The set of evidence provided in this paper shows not only that labor regulation reacts to immigration but also that immigrants' origins matter for shaping labor regulation. We hope that this paper will contribute to future research on

[34] These results are in line with Botero et al. (2004), who suggest in a cross-sectional setting at the country level that protective labor law regulation is negatively related to employment in the formal sector while enhancing employment in the informal one.

the labor market impact of immigration, accounting for endogenous labor regulation, and stimulate further research on the potential effect of immigration on destination countries' labor market institutions and the main mechanisms at play.

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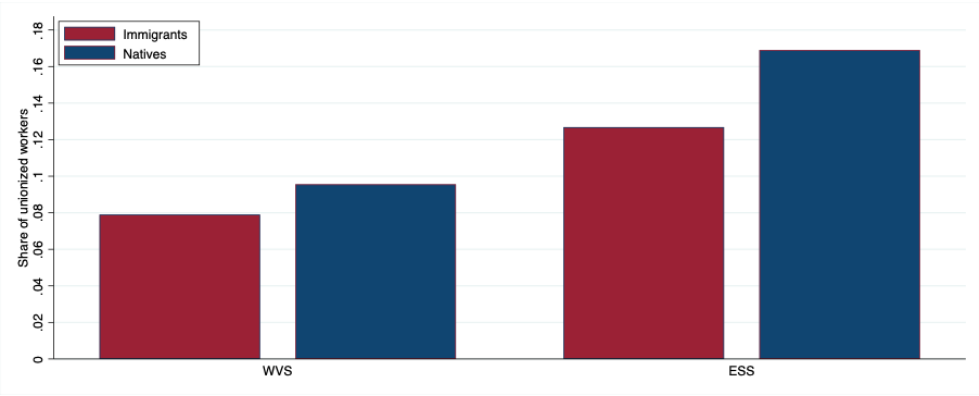
Online Appendix

A Summary of Data and Variable Definition

Figure A-1: Union density - Immigrants and Natives



Note: Authors' calculations on WVS and ESS data. The figure plots the share of unionized workers over the overall employed population by immigration status and by data source.

Table A-1: Variable Definitions and Sources

Variable	Description	Source
PANEL A - WPI		
Workers protection, compacted (2SFA, S.D.)	Calculated using factor analysis composed from 5 subindexes below	Adams et al. (2017)
Working time laws (FA, S.D.)	The index includes following variables: 1) Annual leave entitlements; 2) Public holiday entitlements; 3) Overtime premia; 4) Weekend working; 5) Limits to overtime working; 6) Duration of the normal working week; 7) Maximum daily working time	
Worker dismissal laws (FA, S.D.)	The index includes following variables: 1) Legally mandated notice period; 2) Legally mandated redundancy compensation; 3) Minimum qualifying period of service for normal case of unjust dismissal; 4) Law imposes procedural constraints on dismissal; 5) Law imposes substantive constraints on dismissal; 6) Reinstatement normal remedy for unfair dismissal; 7) Notification of dismissal; 8) Redundancy selection; 9) Priority in re-employment	
Worker representation laws (FA, S.D.)	The index includes following variables: 1) Right to unionization; 2) Right to collective bargaining; 3) Duty to bargain; 4) Extension of collective agreements; 5) Closed shops; 6) Codetermination: board membership; 7) Codetermination and information/consultation of workers	
Industrial action laws (FA, S.D.)	The index includes following variables: 1) Unofficial industrial action; 2) Political industrial action; 3) Secondary industrial action; 4) Lockouts; 5) Right to industrial action	
Employment forms laws (FA, S.D.)	The index includes following variables: 1) The law, as opposed to the contracting parties, determines the legal status of the worker; 2) Part-time workers have the right to equal treatment with full-time workers; 3) The cost of dismissing part-time workers is equal in proportionate terms to the cost of dismissing full-time workers; 4) Fixed-term contracts are allowed only for work of limited duration; 5) Fixed-term workers have the right to equal treatment with permanent workers; 6) Maximum duration of fixed-term contracts; 7) Agency work is prohibited or strictly controlled; 8) Agency workers have the right to equal treatment with permanent workers of the user undertaking	
PANEL B - Country Level Variables		
Share of immigrants	Share of immigrants over 2000 population (%)	Artuç et al. (2014); World Bank (2010)
Epidemiological Effect	Epidemiological term (see Eq. (2))	Adams et al. (2017); Artuç et al. (2014); World Bank (2010)
GDP per capita (log)	Real GDP/capita at constant 2011 national prices (in mil. 2011US$)	Feenstra et al. (2015)
Polity2	Measure of political regime. Time-varying dummy =1 (Democratic regime) for polity score greater or equal to 5 and otherwise =0 (Autocratic regime)	Marshall et al. (2002)
Human capital (log)	Years of schooling	Barro and Lee (2013)
Rule of Law	Rule of Law index	Coppedge et al. (2020)
Shadow Economy	Size of the shadow economy	Elgin et al. (2012)
Civil Liberties	The civil liberties index	House (2016)
Economic Freedom Index	The Economic Freedom Index	Gwartney et al. (2018)
Trade / GDP	Trade (Exports plus Imports) as a share of GDP	World Bank (2018)
ctfp	TFP level at current PPPs (USA=1)	Feenstra et al. (2015)
EU	Dummy = 1 if country is a member of European Union	
ILO	Dummy = 1 if country is a member of the International Labour Organization	
WTO	Dummy = 1 if country is a member of the World Trade Organization	
PANEL C - Labor Market Outcomes Variables		
Unemp rate	Share of unemployed in the total labor force (national estimate)	ILO (2019)
Labor productivity	Labor productivity per hour worked in 2017 USD (converted to 2017 price level with updated 2011 PPPs)	Total Economy Database (2019)
Hrs Worked Pc	Annual hours worked per worker	Total Economy Database (2019)
Gini	Estimate of Gini index of inequality in equivalized (square root scale) household disposable (post-tax, post-transfer) income, using Luxembourg Income Study data as the standard	Solt (2016)
Common law	Time invariant. Dummy = 1 for common law and civil law otherwise	La Porta et al. (2008)
PANEL D - Gravity Model Variables		CEPII (2010), Head et al. (2010)
Bilateral weighted distance	Geodesic distance in km	
Colonial relationship	Dummy = 1 for pair ever in colonial relationship	
Common ethnic language	Dummy = 1 for pair with language shared by at least 9% of populations	
Common official language	Dummy = 1 for pair with same official language	
Horizontal Time difference	Difference in time zones in hours	
PANEL E - Unions and Parties Political Preferences Variables		
Unions	Share of unionized workers over the total workers population	European Social Survey
Lab. Groups	Difference between the percentage of quasi-sentence in favor and against labour groups in parties' political manifesto	Manifesto Project Database, Volkens et al. (2019)

Table A-2: Summary Statistics - 70 Countries, 1970-2010

Variable	Mean	S.D.	Min.	Max.	Obs.	Corr
PANEL A - Workers Protection Index						
$WPI_{\ t}$ (2SFA)	0.00	1.00	-2.55	2.69	630	1.00***
$EmptForm_{\ t}$ (FA)	-0.00	1.00	-1.31	2.79	630	0.74***
$WorkTime_{\ t}$ (FA)	-0.00	1.00	-2.87	1.61	630	0.50***
$WkrDismis_{\ t}$ (FA)	-0.00	1.00	-2.23	1.99	630	0.65***
$WkrRepr_{\ t}$ (FA)	-0.00	1.00	-1.81	2.35	630	0.78***
$IndAction_{\ t}$ (FA)	-0.00	1.00	-1.35	2.30	630	0.29***
PANEL B - Country Level Variables						
Share of migrants $_{t-1}$	5.71	10.19	0.06	135.43	554	
Epidemiological effect $_{t-1}$	0.01	1.01	-3.02	2.68	554	
GDP per capita (log) $_{t-1}$	-4.68	1.11	-7.28	-1.68	554	
Polity2 $_{t-1}$	0.58	0.49	0.00	1.00	554	
Human capital (log) $_{t-1}$	1.61	0.68	-1.63	2.57	554	
Rule of Law $_{t-1}$	0.61	0.32	0.03	1.00	554	
Shadow Economy $_{t-1}$	31.15	14.59	8.11	71.99	495	
Civil Liberties $_{t-1}$	4.73	1.85	1.00	7.00	487	
Economic Freedom Index $_{t-1}$	5.91	1.39	2.45	9.05	499	
Trade / GDP $_{t-1}$	65.32	50.23	1.24	423.28	532	
OECD^{HIC}	0.34	0.47	0.00	1.00	554	
Common law	0.32	0.47	0.00	1.00	554	
PANEL C - Labor Market Outcomes Variables						
Unemp rate $_t$	7.00	5.00	0.20	31.84	322	
Labor productivity $_t$	28.54	20.13	0.64	95.33	394	
Hrs Worked Pc $_t$	1951.26	275.32	1389.88	2746.89	394	
Gini $_t$	0.38	0.09	0.20	0.59	495	
PANEL D - Gravity Model Variables						
Bilateral weighted distance $_t$	8249.82	4622.22	1.00	19781.39	388287	
Colonial relationship $_t$	0.01	0.10	0.00	1.00	388287	
Common ethnic language $_t$	0.16	0.36	0.00	1.00	388287	
Common official language $_t$	0.17	0.37	0.00	1.00	388287	
Common border $_t$	0.01	0.12	0.00	1.00	388287	
Horizontal Time difference $_t$	4.86	3.46	0.00	12.00	388287	

Note: For detailed sources and definitions, see Appendix Table A-1. * p<0.1, ** p<0.05, *** p<0.01.

Table A-3: Workers Protection Index - Summary Statistics by Country

Country	Mean	Min	Max	Country	Mean	Min	Max	Country	Mean	Min	Max
Algeria	1.59	0.31	2.34	Honduras	0.18	0.01	0.2	Portugal	2.05	-0.21	2.69
Argentina	0.86	0.18	1.21	India	-0.01	-0.37	0.17	Qatar	-0.68	-0.77	-0.63
Australia	-1.38	-1.68	-0.61	Indonesia	0.36	0.11	0.85	Saudi Arabia	-1.06	-1.15	-0.53
Austria	1	0.13	1.48	Iran	-0.87	-1.4	-0.35	Senegal	0.69	0.24	1.07
Bangladesh	-0.34	-0.38	-0.05	Ireland	-0.86	-1.63	0.44	Singapore	-0.9	-0.99	-0.66
Belgium	0.39	-0.39	1.25	Israel	-0.08	-0.39	0.43	South Africa	-0.27	-0.76	0.47
Bolivia	0.49	0.35	1.18	Italy	1.63	1.52	1.78	South Korea	0.36	-0.39	1.51
Brazil	0.38	-0.04	0.78	Japan	-0.58	-0.65	-0.49	Spain	1.11	-0.32	1.72
Cameroon	0.06	-0.36	0.24	Jordan	-0.75	-0.95	-0.2	Sri Lanka	-0.05	-0.14	0.08
Canada	-0.93	-1.16	-0.62	Kenya	-1.2	-1.53	-0.43	Sudan	-1.13	-1.73	-0.69
Chile	-0.35	-0.8	0.2	Luxembourg	1.2	-0.96	2.36	Sweden	0.79	-1.29	1.83
Colombia	0	-0.19	0.22	Malaysia	-0.65	-1.05	-0.43	Switzerland	-0.23	-0.57	0.13
Costa Rica	-0.56	-0.57	-0.53	Mali	-0.35	-0.6	-0.01	Syria	-0.57	-0.62	-0.21
Cote d'Ivoire	-0.92	-1.58	0.16	Mexico	0.31	0.31	0.31	Thailand	-0.41	-1.91	0.07
Cyprus	0	-0.21	0.75	Morocco	0.76	-0.07	1.38	Tunisia	0.32	-0.43	1.12
Denmark	0.29	-0.79	0.92	Myanmar	-1.19	-1.2	-1.1	Turkey	0.02	-0.26	0.99
Dominican Republic	-0.53	-0.6	-0.21	Netherlands	0.89	0.19	1.9	Uganda	-1.29	-1.7	-0.3
Ecuador	0.81	0.07	1.57	New Zealand	-0.93	-1.65	-0.52	United Kingdom	-1.15	-1.83	-0.08
Egypt	0.46	-0.14	0.84	Norway	1	-0.04	2.13	United States	-2.46	-2.55	-2.38
Finland	0.77	-0.56	1.85	Pakistan	1.12	-0.25	1.35	Uruguay	0.27	-0.63	0.67
France	1.88	-0.1	2.5	Panama	-0.25	-1.45	0.09	Venezuela	0.79	0.26	1.64
Germany	1.45	1.16	1.94	Paraguay	0.28	0.16	0.44	Zambia	-1.4	-2.09	-1.07
Ghana	-0.44	-0.89	0.32	Peru	0.65	-0.22	1.21				
Greece	0.09	-1.12	1.22	Philippines	-0.57	-2.3	0.16				

Note: List of all 70 countries used in the analysis. Balanced panel with nine five-year periods for each country. The values presented are the average, minimum, and maximum values for the standardized measures of the workers' protection index during the 1970–2010 period.

B Factor Analysis

Table B-1: Factor Analysis - Employment Forms & Working Time

Employment Forms

Factor	(1) Eigenvalue	(2) Difference	(3) Proportion
Factor1	2.047	1.576	0.910
Factor2	0.475	0.168	0.211
Factor3	0.307	0.187	0.136
Factor4	0.120	0.144	0.053

Working Time

Factor	(1) Eigenvalue	(2) Difference	(3) Proportion
Factor1	1.338	0.887	1.049
Factor2	0.451	0.351	0.353
Factor3	0.100	0.104	0.079

Table B-2: Factor Loadings - Employment Forms & Working Time

Employment Forms

Variable	Factor 1	Factor 2	Factor 3	Factor 4
$EmptForm_1$	0.394	0.341	-0.084	-0.109
$EmptForm_2$	0.537	-0.338	-0.154	-0.036
$EmptForm_3$	0.139	-0.004	0.087	0.275
$EmptForm_4$	0.517	0.276	-0.232	-0.015
$EmptForm_5$	0.701	-0.308	-0.084	-0.010
$EmptForm_6$	0.544	0.188	-0.073	0.163
$EmptForm_7$	0.410	0.175	0.322	-0.047
$EmptForm_8$	0.602	-0.088	0.315	-0.050

Working Time

Variable	Factor 1	Factor 2	Factor 3
$WorkTime_1$	0.335	0.409	-0.073
$WorkTime_2$	0.343	0.160	0.068
$WorkTime_3$	0.369	-0.052	0.170
$WorkTime_4$	0.487	-0.008	0.178
$WorkTime_5$	0.621	-0.159	-0.120
$WorkTime_6$	0.050	0.453	-0.020
$WorkTime_7$	0.589	-0.158	-0.123

Table B-3: Correlations - Employment Form & Working Time

Employment Forms

	$EmptForm_{Ind}$
$EmptForm_1$	0.452***
$EmptForm_2$	0.615***
$EmptForm_3$	0.159***
$EmptForm_4$	0.592***
$EmptForm_5$	0.804***
$EmptForm_6$	0.624***
$EmptForm_7$	0.470***
$EmptForm_8$	0.690***

Working Time

	$WorkTime_{Ind}$
$WorkTime_1$	0.420***
$WorkTime_2$	0.430***
$WorkTime_3$	0.463***
$WorkTime_4$	0.610***
$WorkTime_5$	0.778***
$WorkTime_6$	0.0633***
$WorkTime_7$	0.737***

Table B-4: Factor Analysis - Workers' Dismissal & Employment Representation

Workers Dismissal

Factor	(1) Eigenvalue	(2) Difference	(3) Proportion
Factor1	1.878	1.259	0.905
Factor2	0.619	0.374	0.298
Factor3	0.245	0.101	0.118
Factor4	0.143	0.183	0.069

Employment Representation

Factor	(1) Eigenvalue	(2) Difference	(3) Proportion
Factor1	1.047	0.507	0.874
Factor2	0.540	0.320	0.451
Factor3	0.221	0.221	0.184

Table B-5: Factor Loadings - Workers' Dismissal & Employment Representation

Workers Dismissal

Variable	Factor 1	Factor 2	Factor 3	Factor 4
$WkrDismis_1$	0.024	0.174	0.152	0.064
$WkrDismis_2$	0.046	-0.092	0.246	-0.173
$WkrDismis_3$	0.121	-0.091	0.044	0.254
$WkrDismis_4$	0.261	-0.093	-0.268	-0.151
$WkrDismis_5$	0.254	-0.189	0.167	-0.071
$WkrDismis_6$	0.192	-0.157	-0.013	0.167
$WkrDismis_7$	0.191	-0.001	-0.052	-0.049
$WkrDismis_8$	0.166	0.386	-0.137	-0.029
$WkrDismis_9$	0.176	0.277	0.188	0.020

Employment Representation

Variable	Factor 1	Factor 2	Factor 3
$WkrRepr_1$	0.185	0.199	0.028
$WkrRepr_2$	0.209	0.242	0.060
$WkrRepr_3$	0.101	0.083	0.311
$WkrRepr_4$	0.147	0.207	-0.107
$WkrRepr_5$	0.036	-0.202	0.209
$WkrRepr_6$	0.250	-0.238	0.036
$WkrRepr_7$	0.390	-0.223	-0.178

Table B-6: Correlations - Workers' Dismissal & Employment Representation

Workers Dismissal

	$WkrDismis_{Ind}$
$WkrDismis_1$	0.0864***
$WkrDismis_2$	0.190***
$WkrDismis_3$	0.439***
$WkrDismis_4$	0.725***
$WkrDismis_5$	0.711***
$WkrDismis_6$	0.615***
$WkrDismis_7$	0.640***
$WkrDismis_8$	0.510***
$WkrDismis_9$	0.525***

Employment Representation

	$WkrRepr_{Ind}$
$WkrRepr_1$	0.496***
$WkrRepr_2$	0.528***
$WkrRepr_3$	0.237***
$WkrRepr_4$	0.411***
$WkrRepr_5$	0.138***
$WkrRepr_6$	0.634***
$WkrRepr_7$	0.798***

Table B-7: Factor Analysis - Industrial Actions & Workers' Protection Index

Industrial Actions

Factor	(1) Eigenvalue	(2) Difference	(3) Proportion
Factor1	0.922	0.477	1.134
Factor2	0.445	0.577	0.547

Workers Protection Index

Factor	(1) Eigenvalue	(2) Difference	(3) Proportion
Factor1	1.186	1.176	1.450
Factor2	0.010	0.043	0.012

Table B-8: Factor Loadings - Industrial Actions & Workers' Protection Index

Industrial Actions

Variable	Factor 1	Factor 2
$IndAction_1$	0.449	-0.252
$IndAction_2$	0.562	0.058
$IndAction_3$	0.587	-0.116
$IndAction_4$	0.185	0.410
$IndAction_5$	0.163	0.443

Workers' Protection Index

Variable	Factor 1	Factor 2
$EmptForm_{Ind}$	0.305	-0.039
$WorkTime_{Ind}$	0.179	0.024
$WkrDismis_{Ind}$	0.245	-0.015
$WkrRepr_{Ind}$	0.334	0.001
$IndAction_{Ind}$	0.081	0.095

Table B-9: Correlations - Industrial Actions & Workers' Protection Index

Industrial Actions

	$IndAction_{Ind}$
$IndAction_1$	0.613***
$IndAction_2$	0.767***
$IndAction_3$	0.801***
$IndAction_4$	0.253***
$IndAction_5$	0.223***

Workers' Protection Index

	WPI
$EmptForm_{Ind}$	0.752***
$WorkTime_{Ind}$	0.522***
$WkrDismis_{Ind}$	0.661***
$WkrRepr_{Ind}$	0.796***
$IndAction_{Ind}$	0.255***

C Identification Strategy - Additional Results

Table C-1: Predicted Stocks through Gravity Model

	(1)
Estimation:	PPML
Time:	1970-2010
Dep var:	$Stock_{c,j,t}$
$Dist^w_{c,j} * I_{1970}$	-0.038***
	(0.009)
$Dist^w_{c,j} * I_{1975}$	-0.037***
	(0.008)
$Dist^w_{c,j} * I_{1980}$	-0.035***
	(0.008)
$Dist^w_{c,j} * I_{1985}$	-0.034***
	(0.007)
$Dist^w_{c,j} * I_{1990}$	-0.033***
	(0.006)
$Dist^w_{c,j} * I_{1995}$	-0.031***
	(0.006)
$Dist^w_{c,j} * I_{2000}$	-0.030***
	(0.005)
$Dist^w_{c,j} * I_{2005}$	-0.029***
	(0.005)
$Dist^w_{c,j} * I_{2010}$	-0.029***
	(0.004)
Observations	137970
Countries	70
Partial R-Square	0.44

Note: Authors' calculations on World Bank data. Standard errors are clustered at the country level. * p<0.1, ** p<0.05, *** p<0.01. The set of controls includes the interactions between bilateral distance (weighted by population size) and year dummies, year fixed effects, and destination country fixed effects. The dependent variable is the bilateral migration stock.

Table C-2: Weak Instrument Tests

	(1)	(2)
Estimation:	IV	IV
Time:	1970-2010	1970-2010
Dep Var:	WPI	WPI
Equation:	Levels	Differences
$Prot_{t-1}$	0.922***	0.004
	(0.020)	(0.044)
$Share\ Mig_{t-1}$	-0.000	0.002
	(0.001)	(0.005)
$Epid_{t-1}$	0.057***	-0.400
	(0.021)	(0.471)
Year FE	✓	✓
Instruments	10	9
Observations	560	490
KP LM test p-val	0.00	0.00
KP F-stat	812.85	17.00
KP rel bias>30%	0.00	0.00

Note: The table reports weak instrument diagnostics. For the KP p-val, since critical values do not exist for the KP statistic, we follow the approach suggested by Bazzi and Clemens (2013) and use the Stock et al. (2005) 30% of the OLS bias critical values for the multivariate statistic. Standard errors are clustered at the country level. * p<0.1, ** p<0.05, *** p<0.01.

Table C-3: Robustness Checks: Lag Structure of Instruments

	(1)	(2)	(3)	(4)	(5)	(6)
Estimation:	S-GMM	S-GMM	S-GMM	S-GMM	S-GMM	S-GMM
Time:	1970-2010	1970-2010	1970-2010	1970-2010	1970-2010	1970-2010
Dep var:	WPI	WPI	WPI	WPI	WPI	WPI
$Prot_{t-1}$	0.848***	0.822***	0.848***	0.851***	0.829***	0.829***
	(0.054)	(0.081)	(0.054)	(0.054)	(0.047)	(0.048)
$Share\ Mig_{t-1}$	-0.006*	-0.004	-0.006*	-0.006	-0.006*	-0.007*
	(0.004)	(0.005)	(0.004)	(0.004)	(0.004)	(0.004)
$Epid_{t-1}$	0.085***	0.106***	0.081***	0.076***	0.077***	0.077***
	(0.028)	(0.039)	(0.029)	(0.028)	(0.028)	(0.028)
Controls	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓
Country FE	✓	✓	✓	✓	✓	✓
AR1 p-val	0.00	0.00	0.00	0.00	0.00	0.00
AR2 p-val	0.52	0.48	0.54	0.55	0.57	0.57
Hansen p-val	0.78	0.11	0.61	0.80	0.49	0.57
Diff-Hansen p-val	0.91	0.30	0.91	0.79	0.74	0.83
Instruments	22	28	23	27	31	33
Countries	70	70	70	70	70	70
Observations	554	554	554	554	554	554
$First\ lag\ WPI_{t-1}$	3	3	3	3	4	4
$Last\ lag\ WPI_{t-1}$	4	4	5	6	5	7
$First\ lag\ Controls_{t-1}$	2	4	2	2	2	2
$Last\ lag\ Controls_{t-1}$	3	7	3	4	6	6

Note: Standard errors are clustered at the country level. * p<0.1, ** p<0.05, *** p<0.01. The dependent variable is our standardized workers' protection index. As controls, we include the logarithm of GDP per capita, the polity2 index, and the logarithm of human capital. Our main variables of interest are the share of immigrants and the epidemiological effect: the former is instrumented using the predicted immigration share from a gravity model and the latter with the epidemiological effect using predicted bilateral immigration stocks from a shift-share approach. Each column includes a different set of lags. See Appendix A for further information on the variables.

Table C-4: Rotemberg Weights

1975				1990				2010			
(1) Origin	(2) $\hat{\alpha_k}$	(3) $\sum \hat{\alpha_k}$	(4) Ratio	(5) Origin	(6) $\hat{\alpha_k}$	(7) $\sum \hat{\alpha_k}$	(8) Ratio	(9) Origin	(10) $\hat{\alpha_k}$	(11) $\sum \hat{\alpha_k}$	(12) Ratio
Portugal	0.052	1.199	0.434	Portugal	0.079	1.652	0.405	Morocco	0.049	1.582	0.412
Germany	0.057	1.199	0.434	Philippines	0.084	1.652	0.405	Puerto Rico	0.056	1.582	0.412
Mexico	0.083	1.199	0.434	Puerto Rico	0.090	1.652	0.405	Italy	0.065	1.582	0.412
Italy	0.122	1.199	0.434	Italy	0.128	1.652	0.405	Philippines	0.091	1.582	0.412
Pakistan	0.206	1.199	0.434	Mexico	0.288	1.652	0.405	Mexico	0.390	1.582	0.412

Note: Authors' calculations following (Goldsmith-Pinkham et al., 2020) methodology. The table shows the top-five Rotemberg weights ($\hat{\alpha}$) by origin and year (1975, 1990, and 2010). Columns (3), (7), and (11) report the sum of the positive Rotemberg weights, while columns (4), (8), and (12) report the ratio between the sum of the top-five Rotemberg weights by origin and the total positive weights.

Table C-5: Origin country shares and destination countries' characteristics

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Time	1960	1960	1960	1960	1960	1960	1960	1960	1960	1970-2010
	Origin Shares									$\widetilde{Epid}^{SS}_{70-10}$
Origin	GER	ITA	MEX	MOR	PAK	PHIL	POR	PUE	*All*	
$ln(GDP)$	0.005	0.015	0.001	-0.007	-0.042	0.003	0.008*	0.001	-0.016	0.237
	(0.01)	(0.01)	(0.01)	(0.01)	(0.04)	(0.01)	(0.00)	(0.01)	(0.06)	(0.17)
$ln(Col)$	0.005	0.009	0.022	0.007	0.001	0.015	0.001	0.022	0.083	-0.239*
	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.02)	(0.00)	(0.02)	(0.08)	(0.14)
$ln(PopD)$	-0.002	-0.002	-0.004	0.005	0.014	-0.003	-0.006	-0.004	-0.002	-0.078
	(0.00)	(0.00)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.03)	(0.07)
$Polity2$	0.000	0.000	-0.001	-0.001	0.002	-0.001	0.002	-0.001	0.001	0.011
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)
$Common\ Law$	0.023	0.009	0.051	0.011	0.059	0.043	-0.015	0.052	0.233	0.015
	(0.02)	(0.02)	(0.05)	(0.02)	(0.06)	(0.04)	(0.02)	(0.05)	(0.19)	(0.29)
$OECD^{HIC}$	0.023*	-0.013	0.019	0.026	-0.002	0.016	-0.025	0.018	0.063	0.042
	(0.01)	(0.02)	(0.03)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)	(0.11)	(0.43)
Observations	62	62	62	62	62	62	62	62	62	62
R-Square	0.18	0.19	0.10	0.11	0.14	0.10	0.05	0.10	0.12	0.04

Note: Authors' calculations on World Bank and Maddison Project data. * p<0.1, ** p<0.05, *** p<0.01. Columns (1) to (8) report results of a single regression of a 1960 origin-specific share on 1960 destination countries' characteristics. Column (9) reports the results using as a dependent variable the sum of the origin-specific shares identified in Table C-4. Column (10) reports the estimates on the predicted growth of the epidemiological term using the predicted stocks constructed through our shift-share strategy between 1970 and 2010.

Table C-6: Correlation between pre-1960 Indicators and Shift-Share-Based Epidemiological Term Growth

	(1)	(2)	(3)	(4)
Estimation:	OLS	OLS	OLS	OLS
Dep var:	$\widetilde{Epid}^{SS}_{70-80}$	$\widetilde{Epid}^{SS}_{70-90}$	$\widetilde{Epid}^{SS}_{70-00}$	$\widetilde{Epid}^{SS}_{70-10}$
Panel A - GDP per capita				
	0.235	0.361	-0.121	-0.032
	(0.570)	(0.577)	(0.300)	(0.251)
Countries/Observations	68	43	43	40
Panel B - Population				
	1.492	0.033	0.190	0.121
	(0.931)	(0.618)	(0.365)	(0.298)
Countries/Observations	70	45	45	44
Panel C - Legal origin: Common Law				
	0.081	0.065	0.110	0.072
	(0.310)	(0.312)	(0.277)	(0.307)
Countries/Observations	70	70	70	70

Note: Authors' calculations on World Bank and Maddison Project data. * p<0.1, ** p<0.05, *** p<0.01. The dependent variable is our standardized measure of workers' protection. In Panel A (GDP per capita) and Panel B (Population) the table shows the predicted coefficients regressing the growth rate of macro indicators between: 1950 to 1960 (col. 1), 1940 and 1960 (col. 2), 1930 and 1960 (col. 3), and 1920 and 1960 (col. 4) on the national predicted epidemiological effect with our shift-share strategy over different periods. Panel C shows the predicted coefficients of common law legal origin on the national predicted epidemiological effect with our shift-share strategy over different periods.

Table C-7: Robustness Checks: Adao Standard Error Correction

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Estimation:	S-GMM	S-GMM	S-GMM	S-GMM	S-GMM	S-GMM	S-GMM	S-GMM	S-GMM
Time:	1970-2010	1970-2010	1970-2010	1970-2010	1970-2010	1970-2010	1970-2010	1970-2010	1970-2010
Dep var:	WPI	WPI	WPI	WPI	WPI	WPI	WPI	WPI	WPI
SE clustered at:	CNT	GER	ITA	MEX	MOR	PAK	PHL	POR	PUE
$Prot_{t-1}$	0.863***	0.863***	0.863***	0.863***	0.863***	0.863***	0.863***	0.863***	0.863**
	(0.057)	(0.065)	(0.057)	(0.049)	(0.076)	(0.060)	(0.052)	(0.057)	(0.060)
$Share\ Mig_{t-1}$	-0.006	-0.006	-0.006*	-0.006	-0.006*	-0.006	-0.006	-0.006	-0.006
	(0.004)	(0.004)	(0.003)	(0.004)	(0.003)	(0.004)	(0.004)	(0.003)	(0.002)
$Epid_{t-1}$	0.080***	0.080**	0.080**	0.080*	0.080**	0.080**	0.080***	0.080**	0.080*
	(0.030)	(0.033)	(0.031)	(0.038)	(0.038)	(0.032)	(0.027)	(0.034)	(0.006)
Controls	✓	✓	✓	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓	✓	✓	✓
Country FE	✓	✓	✓	✓	✓	✓	✓	✓	✓
AR1 p-val	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AR2 p-val	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51
Hansen p-val	0.79	0.98	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Diff-Hansen p-val	0.84	0.93	0.98	1.00	0.98	0.98	0.95	0.98	(.)
Instruments	28	28	28	28	28	28	28	28	28
Clusters	70	20	20	16	19	19	19	18	2
Countries	70	70	70	70	70	70	70	70	70
Observations	554	554	554	554	554	554	554	554	554

Note: * p<0.1, ** p<0.05, *** p<0.01. The dependent variable is our standardized workers' protection index. As controls, we include the logarithm of GDP per capita, the polity2 index, and the logarithm of human capital. Our main variables of interest are the share of immigrants and the epidemiological effect: the former is instrumented using the predicted immigration share from a gravity model and the latter with the epidemiological effect using predicted bilateral immigration stocks from a shift-share approach. See Appendix A for further information on the variables. The table reports system GMM results across different standard error clusters: country level (col. 1), and grouping countries with similar initial shares of immigrants in the year 1960 from Germany (col. 2), Italy (col. 3), Mexico (col. 4), Morocco (col. 5), Pakistan (col. 6), Philippines (col. 7), Portugal (col. 8), and Puerto Rico (col. 9).

D Additional Analysis

Table D-1: Robustness Checks: Additional Controls

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Estimation:	S-GMM	S-GMM	S-GMM	S-GMM	S-GMM	S-GMM	S-GMM	S-GMM
Time:	1970-2010	1970-2010	1970-2010	1970-2010	1970-2010	1970-2010	1970-2010	1970-2010
Dep var:	WPI	WPI	WPI	WPI	WPI	WPI	WPI	WPI
$WPIt-1$	0.834***	0.806***	0.779***	0.857***	0.864***	0.796***	0.815***	0.822***
	(0.073)	(0.068)	(0.079)	(0.065)	(0.066)	(0.082)	(0.070)	(0.065)
$Share\ Mig_{t-1}$	-0.007	-0.003	-0.006**	-0.009	-0.004	-0.005	-0.005	-0.007
	(0.004)	(0.003)	(0.003)	(0.006)	(0.004)	(0.006)	(0.005)	(0.004)
$Epid_{t-1}$	0.079**	0.091**	0.098**	0.071**	0.077**	0.088**	0.077**	0.087**
	(0.031)	(0.035)	(0.038)	(0.029)	(0.034)	(0.042)	(0.030)	(0.034)
$Rule\ Of\ Law_{t-1}$	-0.134							
	(0.305)							
$Civil\ Liberties_{t-1}$		0.122**						
		(0.054)						
$Shadow\ Econ_{t-1}$			0.003					
			(0.007)					
$Econ\ Freedom_{t-1}$				0.015				
				(0.044)				
$Trade/GDP_{t-1}$					-0.002*			
					(0.001)			
EU						0.269*		
						(0.144)		
ILO							0.365	
							(0.491)	
WTO								0.075
								(0.084)
Controls	✓	✓	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓	✓	✓
Country FE	✓	✓	✓	✓	✓	✓	✓	✓
AR1 p-val	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AR2 p-val	0.53	0.34	0.78	0.91	0.81	0.59	0.56	0.61
Hansen p-val	0.80	0.83	0.85	0.62	0.92	0.06	0.42	0.21
Diff-Hansen p-val	0.81	0.62	0.70	0.56	0.87	0.12	0.42	0.81
Instruments	32	31	32	32	32	31	32	31
Countries	70	70	64	67	70	70	70	70
Observations	554	487	495	499	532	554	554	554

Note: Standard errors are clustered at the country level. * p<0.1, ** p<0.05, *** p<0.01. The dependent variable is our standardized workers' protection index. As controls, we include the logarithm of GDP per capita, the polity2 index, and the logarithm of human capital. Our main variables of interest are the share of immigrants and the epidemiological effect: the former is instrumented using the predicted immigration share from a gravity model and the latter with the epidemiological effect using predicted bilateral immigration stocks from a shift-share approach. As additional controls, we include rule of law index, size of the shadow economy, civil liberties, economic freedom index, trade (exports plus imports) as a share of GDP, European Union membership, International Labour Organization membership, and World Trade Organization membership. See Appendix A for further information on the variables.

Table D-2: Cross-sectional Determinants of Workers' Protection Index

	(1)	(2)	(3)	(4)	(5)	(6)
Estimation:	OLS	OLS	OLS	OLS	OLS	OLS
Dep var:	WPI	WPI	WPI	WPI	WPI	WPI
$Share\ Mig$	-0.027***	-0.018**	-0.018	-0.029***	-0.031***	-0.010
	(0.009)	(0.008)	(0.013)	(0.010)	(0.010)	(0.014)
$Epid$	0.386***	0.256***	0.358***	0.383***	0.394***	0.150
	(0.092)	(0.090)	(0.094)	(0.093)	(0.089)	(0.094)
$ln(GDP)$	0.332**	0.211	0.313	0.335**	0.361**	0.308
	(0.145)	(0.139)	(0.253)	(0.144)	(0.149)	(0.294)
$Polity2$	0.478*	0.548*	0.567*	0.551*	0.368	0.820**
	(0.272)	(0.293)	(0.287)	(0.309)	(0.271)	(0.364)
$ln(HC)$	-0.454	-0.340	-0.583	-0.509	-0.434	-0.677
	(0.296)	(0.306)	(0.472)	(0.329)	(0.278)	(0.472)
$Common\ Law$		-0.684***				-0.949***
		(0.233)				(0.266)
ctfp			-0.313			-0.457
			(0.717)			(0.786)
$Trade/GDP$				0.002		0.002
				(0.002)		(0.002)
$unemp\ rate$					-0.027	-0.003
					(0.019)	(0.025)
Adj. R-Square	0.32	0.42	0.25	0.32	0.31	0.40
Observations	70	70	61	70	68	59

Note: Standard errors are clustered at the country level. * p<0.1, ** p<0.05, *** p<0.01. The dependent variable is the country average workers' protection index over the entire time span. As controls, we include logarithm of GDP per capita, the polity2 index, the logarithm of human capital, a dummy associated with country legal origin, the logarithm of productivity, trade as a share of GDP, and the share of unemployed workers. Our main variables of interest are the share of immigrants and the epidemiological effect. See A for further information on the variables.

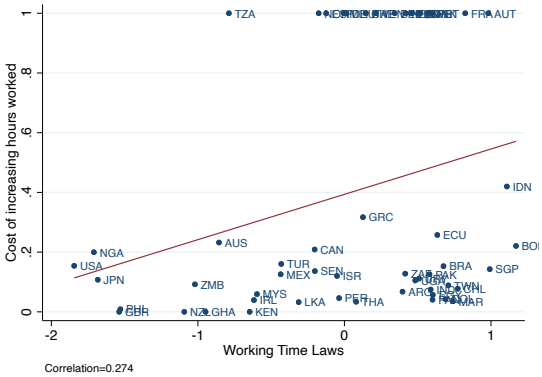
Table D-3: WPI Subcomponents and Labor Market Outcomes

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Estimation:	FE	FE	FE	FE	FE	FE	FE	FE
Time:	1970-2010	1970-2010	1970-2010	1970-2010	1970-2010	1970-2010	1970-2010	1970-2010
Dep var:	Unempl	Labor Produc	Hours worked pc	Gini	Unempl	Labor Produc	Hours worked pc	Gini
Panel A								
$CollectAct_t$	-0.158	0.038	-25.701	-0.006				
	(0.335)	(1.626)	(18.836)	(0.004)				
$CollectAct_{t-1}$					0.376	-0.106	-26.358	-0.005
					(0.304)	(1.435)	(20.139)	(0.004)
Panel B								
$WkrRepr_t$	1.374*	0.752	-27.223*	-0.004				
	(0.704)	(1.218)	(15.984)	(0.004)				
$WkrRepr_{t-1}$					1.788**	0.633	-24.772*	-0.004
					(0.782)	(1.128)	(13.353)	(0.003)
Panel C								
$WkrDismis_t$	0.947	4.182**	-33.619*	-0.004				
	(0.719)	(1.995)	(17.996)	(0.005)				
$WkrDismis_{t-1}$					0.932*	4.103**	-27.838*	-0.001
					(0.525)	(1.712)	(15.891)	(0.005)
Panel D								
$WorkTime_t$	0.131	-0.295	18.508	-0.007				
	(0.718)	(1.328)	(18.508)	(0.004)				
$WorkTime_{t-1}$					-0.458	-0.007	13.557	-0.008*
					(0.604)	(1.096)	(17.743)	(0.004)
Panel E								
$EmptForm_t$	0.986**	4.266***	-31.317**	-0.004				
	(0.405)	(1.037)	(13.138)	(0.003)				
$EmptForm_{t-1}$					0.877**	3.373***	-22.104*	-0.002
					(0.382)	(1.024)	(11.788)	(0.004)
Year FE	✓	✓	✓	✓	✓	✓	✓	✓
Country FE	✓	✓	✓	✓	✓	✓	✓	✓
Countries	68	47	47	69	68	47	47	69
Observations	322	394	394	495	302	353	353	466

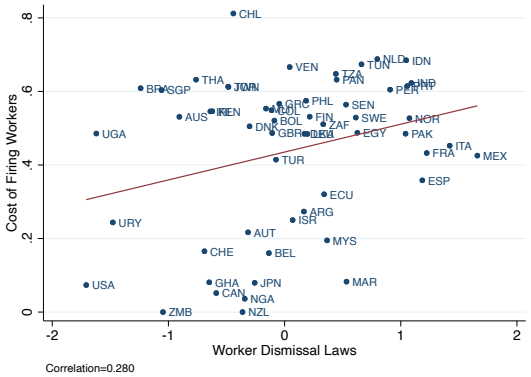
Note: Standard errors are clustered at the country level. * p<0.1, ** p<0.05, *** p<0.01. The dependent variables are the unemployment rate, labor productivity per hours worked, annual hours worked per worker, and Gini index after tax. Each panel provides the estimates associated with the following variables of interest: industrial action laws ($IndAction$), worker representation laws ($WkrRepr$), dismissal laws ($WkrDismis$), working time laws ($WorkTime$), and employment forms laws ($EmptForm$). See Appendix A for further information on the variables.

Figure D-2: Workers' Protection Index Subcomponents - Correlations with Botero et al. (2004)

(a) Employment Forms Laws and Alternative Employment Contracts

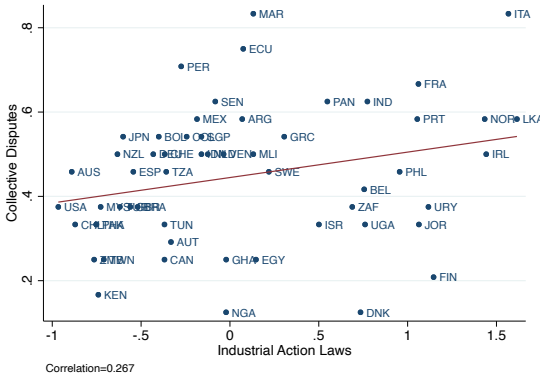


(b) Working Time Laws and Cost of increasing hours worked



(c) Worker Dismissal Laws and Cost of Firing Workers

(d) Worker Representation Laws and Labor Union Power



(e) Industrial Action Laws and Collective Disputes

Note: Authors' calculations on CBR Leximetric data (x-axis) and Botero et al. (2004) (y-axis). The figure plots the 1970–2010 average at the country level of the standardized workers' protection subcomponents on the related cross-sectional measures of workers' protection by Botero et al. (2004).

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ISSN 1379-244X D/2021/3082/21

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