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ANALYZING OCCUPATIONAL LICENSING ACROSS NATIONS

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ABSTRACT

Relatively little is known about occupational licensing across nations. We assemble harmonized estimates of licensing prevalence for 44 countries using nationally representative surveys, including new surveys for previously unstudied countries. Licensing ranges from roughly 14 percent of workers in Denmark to more than 40 percent in India and South Africa. Licensed workers earn 6 to 19 percent higher wages than comparable unlicensed workers across specifications. Licensing prevalence is negatively associated with GDP per capita and governance quality, and positively associated with informal employment, suggesting occupational licensing is intertwined with labor market efficiency, formalization, and long-run economic development.

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1 Introduction

Occupational licensing (the requirement that workers obtain government permission in the form of a license to legally practice certain professions) has become a widespread form of labor market regulation around the world. This institution has expanded dramatically over time: in the United States, for example, the share of the workforce covered by occupational licensing grew from about 5% in the 1950s to roughly one-quarter of the workforce by the early 2000s (Figure 1).

Relatively little is known about occupational licensing across nations. Current estimates generally place occupational licensing coverage in many advanced economies, including the United States and much of Europe, at roughly one-fifth to one-quarter of the workforce, depending on the survey instrument and definition employed (Cunningham (2019)). Governments typically justify licensing as a means to protect consumers and ensure quality by mandating minimum qualifications for practitioners. However, by erecting barriers to entry and mobility, licensing can also restrict labor supply and worker mobility, with potentially far-reaching implications for wages, employment opportunities, and economic efficiency.

Against this backdrop, our research investigates how the prevalence of occupational licensing varies across nations, with a special focus on regions that have previously lacked data on this type of regulation. To date, much of what is known about licensing comes from studies in the United States and other advanced countries. National statistical surveys run by governments in the U.S. and Europe have only recently begun to include questions on whether workers hold a required license. In contrast, there is very little existing data on occupational licensing in developing regions, including large parts of South America, Africa, and Asia. This knowledge gap is significant: if licensing is prevalent in developing economies, it could shape labor market outcomes in ways similar to or even more pronounced than in more developed countries, affecting worker mobility, job access, and growth in those settings.

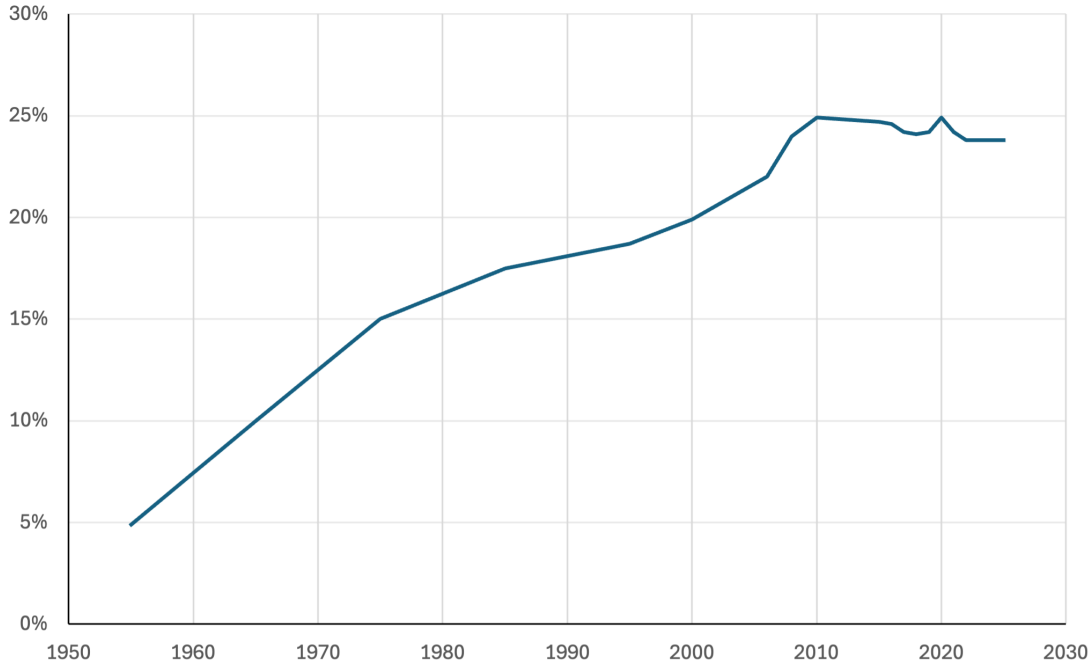
Understanding the global extent of licensing is thus important for both labor economics research and policy.

This paper provides the most comprehensive cross-national analysis of occupational licensing rates using new survey data. We collect original survey evidence on licensing in countries where such data were previously unavailable such as Argentina, India, Mexico, and South Africa among many others and compare these findings to existing data from the U.S. and Europe. By doing so, we attempt to answer two main questions: (1) How prevalent is occupational licensing outside of the advanced industrial nations, and do developing countries exhibit similarly high (or higher) rates of licensed employment? (2) What are the implications of global licensing patterns for labor market policy, especially in terms of worker mobility and economic development? The analysis is motivated by the policy relevance of occupational licensing worldwide. Licensing requirements can influence labor market outcomes by raising entry costs into professions, potentially leading to higher earnings for licensed workers but also to reduced competition, raise consumer prices, and put constraints on the movement of workers. These issues are not only of concern in wealthy countries; they are arguably even more salient in developing economies where informality and barriers to employment are ongoing challenges. It is also possible that licensing could raise human capital in developing economies by requiring additional schooling (Kleiner and Soltas (2023)).

1.1 Literature

Occupational licensing has been studied extensively in the context of advanced economies, with a rich empirical literature documenting its prevalence and labor market effects. Kleiner (2000) outlines the central trade-off of

Figure 1: Share of US Labor Force With An Occupational License



Notes: This figure plots the share of U.S. workers employed in occupations requiring a government-issued license over time. Estimates are drawn from prior nationally representative surveys summarized in the occupational licensing literature, including the Westat Professional Data Initiative survey developed and analyzed by Kleiner and Krueger (2013) and subsequent supplements to the Current Population Survey. A worker is classified as licensed if their job legally requires a license issued by a federal, state, or local government agency. Voluntary certifications are excluded. The figure illustrates the substantial expansion of occupational licensing in the United States since the mid-20th century.

occupational licensing: while licensing may improve service quality by ensuring practitioners meet minimum competency standards, it also restricts the supply of labor into licensed occupations, driving up the price of services and potentially the wages of licensed workers. In other words, licensing can confer benefits in the form of consumer protection, but it imposes costs by creating barriers to entry that can lead to higher costs for consumers and limited access and competition. Subsequent studies have confirmed elements of this trade-off. A growing body of evidence indicates that licensing requirements tend to raise wages for those who obtain licenses, while reducing employment in the licensed profession and raising prices for services, often without clear improvements in quality or safety delivered to the public. For example, [Kleiner and Kudrle \(2000\)](#) find that more stringent licensing exam requirements for dentists did not lead to better dental health outcomes for patients but did result in higher prices for basic dental services, presumably because tougher exams reduced the supply of dentists. Similarly, [Kleiner and Todd \(2009\)](#) show that stricter licensing of mortgage brokers had no measurable impact on foreclosure rates (a proxy for service quality) yet led to higher mortgage costs, again likely due to restricted entry of providers. These cases illustrate the pattern that tighter licensing often benefits practitioners through reduced competition, rather than consumers.

One of the landmark empirical findings on licensing is how widespread it has become in the U.S. labor market. In a national descriptive study, ([Kleiner and Krueger 2013](#)) presented the first nationally representative estimates of workers' attainment of government-issued occupational licenses. Earlier studies generally measured whether workers were employed in occupations covered by licensing laws rather than whether workers themselves had actually attained a government-issued occupational license. This share represents a dramatic rise from the 1950s, when only around 1 in 20 workers were in licensed occupations. They also find that licensing in the U.S. is more common among workers

with higher levels of education, and that unionized and public-sector workers are especially likely to work in jobs that require licenses. More recently, (Kleiner and Wang 2026) show that occupational licensing is substantially more prevalent in the public sector than in the private sector, with public-sector workers more than twice as likely to hold occupational licenses. Subsequent surveys by other researchers and government agencies have generally found licensing prevalence in the U.S. (Gittleman et al. (2018)) in the range of roughly one-fifth to one-quarter of workers, depending on the exact definitions and survey methods. Notably, there is substantial variation in licensing incidence across U.S. states: Kleiner and Vortnikov (2017) document that some states have as little as about 12–15% of their workforce licensed, while others have well over 30%, reflecting different occupational regulations at the state level as well as the industry composition of the state. This interstate variability underscores that licensing is a policy choice amenable to local laws, and it foreshadows the kind of cross-country differences one might expect when comparing national licensing regimes.

Beyond measuring its prevalence, the literature has examined how occupational licensing impacts labor market outcomes such as wages, employment, and inequality. A consistent finding is that licensing confers a wage premium to those who become licensed. Kleiner and Krueger (2013) estimated that holding a license is associated with approximately 15% higher wages, all else equal, an effect comparable in magnitude to the wage premium from union membership. This makes intuitive sense: by restricting entry, licensing can create a scarcity of qualified workers in an occupation, allowing those who are licensed to command higher pay. Follow-up studies have refined these estimates; for instance, Gittleman et al. (2018) find wage gains in licensed jobs on the order of 10–12%, though the exact premium can vary by occupation and methodology. Importantly, however, the distributional consequences of licensing appear to differ from those of unions. Whereas unions tend to compress wage distributions (raising the bottom and lowering the top, thus reducing inequality), licensing has not been found to significantly reduce wage dispersion among practitioners. In fact, some evidence suggests licensing may increase inequality by raising wages mostly for higher-earning professionals. Kleiner (2015) notes that licensing effectively transfers income from consumers to licensed workers via higher prices, without the equalizing effect that collective bargaining might have on wage determination.

Licensing’s impact on employment and labor supply is generally found to be negative – consistent with classical theory that erecting barriers to entry will reduce the number of practitioners. A comprehensive review of the theoretical and empirical literature is provided by Kleiner (2006), who surveys evidence on licensing’s effects on wages, employment, prices, service quality, and labor mobility. Kleiner (2006) and later analyses estimate that licensing laws result in fewer jobs in the regulated occupations than would otherwise exist. Using simulation methods, Kleiner (2015) estimates that occupational licensing may reduce U.S. employment by approximately 2.85 million jobs while increasing consumer costs through higher prices. While such estimates involve some speculation, they underscore the potential macroeconomic significance of licensing. Moreover, licensing can have spillover effects on labor allocation: when certain jobs are harder to enter, workers (especially those of lower income or with less education) may be diverted into lower-paying or unregulated occupations. There is also emerging evidence that licensing can slow down innovation and business dynamism by making it harder for new entrants to compete in licensed fields. On the other hand, to the extent licensing encourages workers to obtain more training or credentials (to meet licensing standards), it could have positive effects on human capital. Meanwhile, the net effect on service quality has often been hard to discern. The extent to which licensing improves service quality remains an active area of research and is the focus of both Kleiner and Soltas (2023) and Carollo et al. (2024). Overall, the literature to date shows many cases where the consumer benefits

of licensing are limited or unproven, whereas the costs in terms of higher prices and restricted labor supply are more clearly demonstrated. Evidence from a broad set of international case studies similarly finds limited and inconsistent effects of occupational licensing on service quality despite often generating higher prices and barriers to entry (Kleiner and Koumenta (2022)). This has led economists to call for careful consideration of which occupations truly require licensing for public safety, and which might be better served with lighter forms of regulation or certification.

A particularly active area of research examines occupational licensing and labor mobility. Since licenses are typically jurisdiction-specific (for example, most U.S. licenses are issued by states), licensed workers may face hurdles if they move to a new state or country and must re-qualify. Johnson and Kleiner (2020) provide compelling evidence that licensing can act as a significant barrier to worker mobility across regions. They found that in the U.S., interstate migration rates for individuals in occupations with state-specific licensing exams were about 3 to 5% lower than for similar individuals in other occupations without such onerous requirements. In contrast, occupations with national or widely recognized licensing standards (where credentials can transfer more easily) did not show this migration penalty. Their study links the rise in occupational licensing to a portion of the observed decline in interstate migration and job transitions in the U.S., suggesting that licensing is affecting the fluidity of the labor market. Consistent with this, recent policy reforms aimed at easing mobility (such as state laws adopting universal recognition of out-of-state licenses) have been found to increase the interstate migration and employment of licensed workers. Bae and Timmons (2023) document that when states accept licenses from elsewhere, employment in the affected occupations grows without compromising service quality. These findings are highly relevant for international comparisons: if countries have very different licensing rules, skilled workers may find it difficult to move where their skills are needed, leading to inefficient allocation of talent across nations. Further, licensing reduces mobility between occupations further reducing labor market efficiency (Kleiner and Xu (2025)).

Finally, we note that comparative research on occupational licensing outside the United States is beginning to grow. In Europe, a major study by Koumenta and Pagliero (2019) was the first to measure licensing prevalence across all EU member states. Using a special module in the European Labour Force Survey, they found that about 22% of workers in the Europe are in occupations subject to licensing requirements, although this average masks considerable cross-country variability. Some EU countries have less than 15% of workers licensed while others approach 30%, reflecting different regulatory traditions. Koumenta and Pagliero (2019) also estimated that EU workers in licensed occupations earn roughly 4% higher hourly wages on average than comparable workers in unlicensed jobs. Interestingly, their analysis attributes about one-third of this wage effect to economic rents (higher pay due to reduced competition) and the remaining two-thirds to signaling, occupational commitment, or human capital accumulation. They further find that licensing in Europe tends to increase wage inequality modestly, and they document heterogeneity in wage gains from licensing by occupation and education level. Other comparative work includes studies of specific countries: for instance, surveys in the UK indicate that roughly 19–22% of British workers need a license to perform their jobs, and that this fraction has been rising over time in line with U.S. trends. Meanwhile, some early studies in developing countries have typically focused on specific professions or case studies rather than broad surveys. For example, the International Labour Organization sponsored reviews of licensing systems in countries like Egypt, Jordan, and Tunisia, but these largely document regulatory frameworks rather than providing workforce-wide statistics. In summary, the empirical literature to date suggests that occupational licensing is an important and widespread labor market institution in many advanced economies, with significant effects on wages, employment, and mobility. However, there remains a lack

of comprehensive data and analysis for much of the world. Our study aims to contribute to this literature by extending the empirical analysis of licensing to new national contexts, thereby filling a notable gap in our understanding of how licensing operates across diverse economies.

Our findings point to four central conclusions. First, occupational licensing is a pervasive labor market institution across countries at all stages of development, with the typical country in our sample licensing roughly one-quarter of its workforce. Second, several developing and middle-income economies (including India, South Africa, the Philippines, and Chile) exhibit licensing rates that equal or exceed those observed in the United States and much of Europe, challenging the view that licensing is primarily a feature of advanced economies. Third, licensed workers generally earn higher wages than comparable unlicensed workers, with pooled regressions indicating positive licensing wage premia that range from roughly 6 to 19 percent depending on weighting and specification choices. Fourth, countries with higher occupational licensing prevalence tend to exhibit lower levels of GDP per capita, larger informal sectors, and weaker governance outcomes, including lower regulatory quality, weaker rule of law, and reduced control of corruption. While these relationships are descriptive, they suggest that occupational licensing may be connected to broader institutional environments that shape labor market allocation, formal-sector participation, and economic performance.

Taken together, these findings suggest that occupational licensing may affect labor market outcomes through multiple channels, including higher wages for incumbent workers, barriers to entry, reduced labor mobility, higher consumer prices, greater informality, weaker economic dynamism, and broader patterns of economic misallocation.

The paper is structured as follows: Section 2 presents our survey and empirical strategy. Section 3 discusses the results. Section 4 concludes.

2 Data and Empirical Strategy

The cornerstone of our data is a combination of newly collected original surveys and previously existing nationally representative occupational licensing datasets. We designed and administered new surveys to capture the incidence of occupational licensing in countries where comparable licensing data previously did not exist. These surveys were administered from 2023 through 2026 using nationally representative samples of the workforce in each country (in collaboration with Qualtrics, a professional survey firm). Each survey asked respondents a series of questions closely modeled on those used in prior U.S. and European studies (such as the survey of [Kleiner and Krueger \(2013\)](#) to ensure comparability. In particular, respondents were asked whether a government license is required to do their job, and whether they personally hold such a license. This definition of “license” was carefully specified to correspond to a legal requirement mandated by federal, state, or local authorities as opposed to voluntary certifications or professional memberships that are not legally required. By focusing on compulsory licensing, we aimed to measure the share of workers for whom government regulation imposes a credential barrier to working in their occupation, which is the concept comparable across different countries’ regulatory regimes. We additionally collected basic demographic and job information (education, occupation, industry, etc.) from respondents to allow for disaggregation of licensing rates by worker characteristics.

In addition to licensing status, our surveys collected self-reported earnings information for respondents. Depending on the country survey instrument, respondents reported either hourly, weekly, monthly, or annual earnings, along with hours worked and weeks worked where available. To facilitate cross-country comparability, we harmonize these measures into a common wage variable and include wage-period fixed effects in the regressions to absorb differences

in reporting units across surveys. Wage regressions are therefore estimated using the harmonized survey earnings measures constructed from the underlying nationally representative licensing surveys.

By assembling these sources, we have a dataset covering multiple countries. In each case, we strive to ensure that the measures of licensing are as equivalent as possible. All statistics refer to the proportion of currently employed workers who currently have a job that requires a government-granted license. We exclude purely voluntary or private certifications from the counts, focusing only on roles where legal licensure is mandatory for practice (for example, doctors, lawyers, teachers in many jurisdictions, certain trades like electricians, etc.). It is worth mentioning that in our surveys across nations, we took care to phrase the question in simple, clear terms given that the concept of occupational licensing is not always well-known to respondents. We are confident that this approach captured the intended information, as evidenced by high response rates and respondents' ability to identify whether their job was subject to licensure. Finally, our analysis also incorporates basic labor force data (employment totals, occupational distributions) from each country to weight the results appropriately. The data thus allow us to calculate the proportion of workers in each country who are in licensed occupations, and to compare those proportions across countries and across subgroups of workers within each country.

To examine the relationship between occupational licensing and economic development, we merge our licensing estimates with country-level GDP per capita data from the Maddison Project Database 2023 release ([Bolt and van Zanden \(2024\)](#)). The Maddison Project provides internationally comparable estimates of GDP per capita for a broad set of countries and is widely used in the comparative economic development literature.

Importantly, Maddison GDP per capita estimates are expressed in purchasing-power-parity (PPP) adjusted international dollars rather than market exchange rates. PPP adjustment accounts for differences in price levels across countries and therefore provides a more accurate measure of cross-country living standards and real economic output. Throughout the paper, GDP per capita refers to PPP-adjusted GDP per capita from the Maddison Project Database.

In summary, the data for this study consist of new survey evidence on licensing, combined with existing licensing statistics for the U.S. and the EU. Surveys were translated into the native language of the nation. This provides the most comprehensive cross-national dataset on occupational licensing to date. A summary of the key variables and sources is provided in Appendix [Table 5](#), and [Figure 2](#) illustrates the headline comparison of licensing rates across these nations.

2.1 Data Sources by Country

Our cross-national occupational licensing dataset combines several previously existing nationally representative licensing datasets with a large number of newly collected original surveys conducted specifically for this study.

For the United States, we rely primarily on the nationally representative Westat Professional Data Initiative (PDII) survey analyzed by [Kleiner and Krueger \(2013\)](#), along with subsequent occupational licensing estimates derived from the Current Population Survey and related analyses of state-level licensing prevalence ([Kleiner and Vorotnikov 2017](#)). These surveys provide the benchmark occupational licensing measures that have become standard throughout the U.S. occupational licensing literature. We additionally draw on the broader U.S. licensing literature examining the evolution, welfare consequences, and labor market effects of occupational licensing, including [Carollo et al. \(2024\)](#), [Kleiner and Soltas \(2023\)](#), [Kleiner and Todd \(2009\)](#), [Kleiner and Kudrle \(2000\)](#), and [Bae and Timmons \(2023\)](#). In addition we use data the Current Population Survey from recently added questions on occupational licensing.

For European countries, we use the occupational regulation data assembled by [Koumenta and Pagliero \(2019\)](#) which are derived from a special module of the European Labour Force Survey. Their dataset provides harmonized occupational licensing and regulatory measures across European Union member states and remains the principal source of comparable European licensing estimates.

For Japan, we rely on the nationally representative survey evidence presented in [Morikawa \(2018\)](#) which develops the first nationally representative measures of occupational licensing prevalence in Japan and examines its relationship with labor market outcomes.

For all remaining countries in our sample, including the newly covered countries in Latin America, Africa, Asia, and Oceania, we designed and administered original nationally representative surveys between 2023 and 2026 in collaboration with Qualtrics. These surveys closely mirror the conceptual framework and question wording developed in [Kleiner and Krueger \(2013\)](#) in order to maximize cross-country comparability. Surveys were translated into the native language of each country and subsequently reweighted to match nationally representative demographic distributions using IPUMS population benchmarks.

Appendix Table A1 provides a complete listing of countries, underlying data sources, survey years, and source classifications.

2.2 Construction of the Occupational Licensing Variable

Our measure of occupational licensing closely follows the approach developed by Kleiner and Krueger (2013), which is designed to identify *de facto* government-mandated licensing at the individual worker level. This approach distinguishes legally required occupational licenses from voluntary certifications or credentials and has become the standard in the U.S. literature.

Kleiner and Krueger (2013) approach. In the U.S. Westat Professional Data Initiative (PDII) survey analyzed by Kleiner and Krueger (2013), licensing status is determined using a two-question sequence that explicitly separates legal requirements from voluntary credentials. Respondents are first asked:

Q11. Do you have a license or certification that is required by a federal, state or local government agency to do your job?

Response options: Yes / No / In process

Respondents are then asked a follow-up question designed to establish whether the credential is legally required:

Q11a. Would someone who does not have a license or certificate be legally allowed to do your job?

Response options: Yes / No

Under this classification rule, an individual is defined as *licensed* if they report either currently holding or being in the process of obtaining a credential (**Q11 = Yes or In process**) *and* report that a person without the credential would *not* be legally allowed to perform the job (**Q11a = No**). Individuals who report holding a credential but indicate that the job can legally be performed without it (**Q11 = Yes and Q11a = Yes**) are classified as certified but not licensed, while those reporting no credential (**Q11 = No**) are classified as unregulated.

This two-step structure is critical for isolating legally binding occupational licensing from voluntary or employer-specific certifications and has been widely adopted in subsequent U.S. studies.

Implementation in our surveys. Our surveys in Argentina and Mexico were explicitly designed to mirror this conceptual framework. Respondents were asked whether their job requires a government-issued license or permit to legally practice the occupation and whether an individual without such a credential would be legally permitted to perform the same job. As in Kleiner and Krueger (2013), we define a worker as licensed only if the credential is legally required for practice. Following their sample construction, we exclude respondents who answer “don’t know” or “not applicable” to the licensing questions, as these responses do not provide interpretable information about legal requirements.

Contrast with the approach of Koumenta and Pagliero (2019) for Europe Our definition differs from the approach used in the European Union study by Koumenta and Pagliero (2019), which relies on survey questions included in the EU Survey of Regulated Occupations (EU-SOR). In the European survey, respondents are asked:

“In addition to this education, do you have a professional certification, licence or did you have to take an exam which is required to practice your occupation?”

Response categories include: *Yes*; *No, but currently in process of obtaining one*; *No*; and *Don’t know / No answer*. Interviewers are instructed that a licence or certification “shows you are qualified to perform a specific job and may give you the right to enter a regulated profession,” with examples such as “licensed medical doctor” or “licensed taxi driver.”

This is followed by the question:

“Without this professional certification, licence or exam would you be legally allowed to practice your occupation?”

Comparability. Despite these differences in question design, these questions are about the same across surveys and the resulting licensing prevalence estimates are broadly comparable across countries after reweighting.

Reweighting and Sample Construction To ensure that our licensing estimates are nationally representative and comparable to prior work, we reweight our survey data using population benchmarks from IPUMS microdata on education, age, and gender (Ruggles et al. 2025). Specifically, we construct post-stratification weights so that the joint distribution of respondents by gender, age, and educational attainment in each country matches the corresponding distribution in the nationally representative IPUMS samples. Additionally, we winsorize weights at the 5th and 95th percentiles to ensure individual cases are not over- or underweighted. This approach corrects for differential response rates across demographic groups and for the overrepresentation of workers in highly regulated occupations that can arise in unweighted survey samples.

In constructing the licensing measure, we follow the sample restrictions used in Kleiner and Krueger (2013). We drop observations in which respondents answered “don’t know” or “not applicable” to the question of whether their job requires a government-issued occupational license. We additionally drop observations in which respondents provided contradictory answers, that is they responded that they they do not hold a license, but that a license is required for their job. As in the U.S. surveys analyzed by Kleiner and Krueger (2013), these responses are difficult to interpret and may reflect confusion about the legal requirement rather than true licensing status. Excluding such observations yields a cleaner measure of de facto occupational licensing among workers who are able to report their regulatory status with confidence.

All reported licensing rates and wage regressions use these reweighted samples unless otherwise noted. Reweighting substantially reduces the sensitivity of licensing prevalence estimates to the occupational composition of the raw survey data and yields licensing rates that are closely aligned with external benchmarks from the United States, the United Kingdom, and the European Union.

2.3 Construction of Wage Measures

Our wage regressions use self-reported earnings information collected in the underlying occupational licensing surveys. Because survey instruments differed somewhat across countries, respondents reported earnings at different frequencies including hourly, weekly, monthly, or annual intervals depending on the survey design and local labor market conventions.

To construct a harmonized wage measure, we convert all earnings responses into a common hourly wage metric whenever sufficient information on hours worked and weeks worked is available. For respondents reporting weekly earnings, hourly wages are computed by dividing weekly earnings by usual weekly hours worked. For monthly and annual earnings measures, hourly wages are constructed using reported hours worked per week and weeks worked per year where available. In cases where exact annual weeks worked are unavailable, we use standard full-time equivalent assumptions based on country-specific labor force conventions.

Because nominal wage levels differ substantially across countries and survey instruments, all wage regressions are estimated using the natural logarithm of the harmonized wage measure and include country fixed effects as well as wage-period fixed effects (hourly, weekly, monthly, annual) to absorb systematic cross-country differences in price levels, currencies, and reporting units. The resulting estimates should therefore be interpreted as within-country partial correlations between occupational licensing status and earnings rather than direct comparisons of wage levels across countries.

We additionally winsorize the wage distribution at the 1st and 99th percentiles within countries to reduce the influence of extreme outliers and reporting errors, particularly among self-employed respondents and workers in informal labor markets.

2.4 Wage Regressions and Empirical Specification

A central question in the occupational licensing literature is whether holding a license is associated with higher wages, consistent with licensing restricting entry and generating economic rents for incumbents. Using the harmonized wage measures constructed from the underlying occupational licensing surveys, we estimate standard Mincerian wage regressions relating individual earnings to licensing status and observable worker characteristics.

Specifically, we estimate log wage equations of the following form:

$$\ln(w_i) = \alpha + \beta \text{Licensed}_i + \gamma X_i + \delta_{o(i)} + \lambda_{c(i)} + \varepsilon_i, \quad (1)$$

where w_i denotes hourly wages (or monthly wages where hourly measures are unavailable) for individual i . The indicator variable Licensed_i equals one if the individual reports that their job requires a government-issued occupational license and that they personally hold such a license. The vector X_i includes standard Mincerian controls, such as educational attainment, potential labor market experience and its square, gender, and marital status. We additionally

include country fixed effects $\lambda_{c(i)}$ in pooled specifications to control for cross-country differences in wage levels and labor market institutions.

The coefficient of interest, β , captures the conditional wage premium associated with holding an occupational license, net of observable worker characteristics and occupation-level differences. In this framework, β can be interpreted as the percentage difference in wages between licensed and unlicensed workers within the same occupation and country, holding constant education and experience. While this estimate does not have a causal interpretation absent exogenous variation in licensing status, it provides a useful benchmark that is directly comparable to prior studies of occupational licensing in the United States and Europe.

In particular, we estimate regressions of the form:

$$\ln(w_i) = \alpha + \beta_1 \text{Licensed}_i + \beta_2 (\text{Licensed}_i \times \text{College}_i) + \gamma X_i + \delta_{o(i)} + \lambda_{c(i)} + \varepsilon_i \quad (2)$$

where College_i is an indicator for whether the worker has completed tertiary education. The interaction term $\text{Licensed}_i \times \text{College}_i$ allows the licensing wage premium to differ between college-educated and non-college-educated workers, motivated by prior evidence that licensing rents tend to be larger in high-skill professions and may contribute to wage inequality.

All regressions are estimated using survey weights where applicable, and standard errors are clustered at the occupation level to account for within-occupation correlation in wages and licensing status.

In the next section, we describe the results, highlighting the major patterns that emerge from this novel data, particularly the surprisingly high rates of occupational licensing observed in the developing-country context.

3 Results

3.1 Average Licensing of Labor Forces Across Nations

Figure 2 reports the reweighted share of workers reporting that their job requires a government-issued occupational license for the 44 countries in our cross-national sample. Three features of the cross-country distribution stand out. First, occupational licensing is a pervasive feature of formal labor markets in every country we examine: even at the bottom of the distribution, no country has a licensed share below roughly one in seven workers. Second, the spread across nations is large—roughly a threefold range from the least to the most heavily licensed labor force. Third, and most striking, the countries at the very top of the distribution are not the wealthy advanced economies that have been the traditional focus of the literature, but a mix of developing and middle-income economies alongside a small number of high-income outliers.

The most heavily licensed labor forces in our sample are India (42.5%), South Africa (40.2%), and Australia (39.4%), with shares well in excess of those typically reported for the United States or for the European Union as a whole. A second tier of countries with licensing rates above 30 percent includes Germany (32.9%), the Philippines (32.7%), Chile (32.3%), Japan (31.2%), Croatia (31.2%), and Israel (30.5%). The presence of India, South Africa, the Philippines, and Chile near the top of the distribution is particularly noteworthy: it directly contradicts the implicit prior—reflected in the relative lack of prior cross-country data—that licensing is primarily a feature of high-income labor markets. If anything, several large developing economies appear to license a larger share of their formal-sector workforce than do the United States, the United Kingdom, or the average European Union member state.

The countries at the top of the distribution also suggest that high occupational licensing prevalence may arise from quite different institutional histories. India’s high licensing share is consistent with its broader post-independence regulatory architecture, in which labor markets, product markets, and professional entry were shaped by extensive government regulation. Following independence, India adopted a highly interventionist economic framework that relied heavily on licensing, permitting, and administrative oversight across much of the economy. Labor markets likewise became highly regulated through legislation such as the Industrial Disputes Act of 1947 and subsequent state-level amendments. A substantial literature links these labor regulations to lower formal-sector employment, investment, manufacturing growth, and productivity (Besley and Burgess 2004; Aghion et al. 2008; Hasan et al. 2012). Occupational licensing may therefore represent one component of a broader institutional environment in which entry into formal economic activity is mediated through government approval, credentialing, and administrative regulation.

South Africa’s high licensing prevalence may reflect a different but related institutional evolution. Following the end of apartheid, South Africa deliberately constructed one of the most protective labor-market systems among emerging economies, emphasizing collective bargaining, employment protections, minimum labor standards, and expanded worker rights. These reforms sought to remedy the exclusionary labor-market institutions inherited from apartheid but also increased the regulatory intensity of the formal labor market. Previous research has emphasized that South Africa combines relatively strong labor-market institutions with persistently high unemployment, labor-market dualism, and a large informal sector (Bhorat 2004; World Bank 2022). Occupational licensing may therefore operate alongside bargaining councils, labor protections, and professional regulation as part of a broader institutional framework governing access to formal employment.

Germany provides a contrasting example. Rather than reflecting weak institutions or administrative inefficiency, Germany’s relatively high occupational licensing rate is consistent with its coordinated market economy, which places substantial emphasis on occupational credentialing, apprenticeship systems, sectoral bargaining, works councils, and codetermination. The broader varieties-of-capitalism literature argues that coordinated market economies rely more heavily on formal occupational qualifications, industry associations, apprenticeship systems, and collective labor-market institutions than liberal market economies (Hall and Soskice 2001). Recent empirical work further finds that codetermination affects firm governance, investment, and labor relations while interacting with Germany’s broader system of worker representation (Jäger et al. 2021). More generally, Germany’s labor-market institutions combine decentralized wage adjustment with strong occupational training and credentialing systems that facilitate coordination between workers and firms (Dustmann et al. 2014). Germany’s relatively high licensing prevalence may therefore reflect an institutional equilibrium in which occupational qualifications and formal credentials play a particularly important role in allocating labor.

Australia provides another interesting case. Although Australia consistently ranks among the world’s highest-income economies and scores highly on most measures of governance quality, it nevertheless exhibits one of the highest occupational licensing rates in our sample. One possible explanation is Australia’s extensive regulation of skilled trades, construction occupations, and health professions, many of which are licensed at the state and territory level. Australia has also historically relied on occupational licensing and registration as complements to vocational education and apprenticeship systems, particularly in industries where public safety and technical competence are emphasized. The Australian experience therefore illustrates that high occupational licensing prevalence is not confined to countries with weaker institutions or lower levels of economic development. Rather, licensing may emerge under very different

institutional arrangements, reinforcing the broader conclusion that similar licensing rates can arise from distinct labor-market models.

By contrast, the relatively low licensing shares observed in several Nordic countries suggest that labor-market protections can be delivered through institutional mechanisms other than occupational licensing. Denmark, Sweden, and Finland combine generous social insurance with relatively flexible labor markets, strong collective bargaining institutions, and extensive active labor-market policies. Denmark’s well-known flexicurity model, for example, combines comparatively low barriers to hiring and dismissal with generous unemployment insurance, retraining programs, and public employment services (Madsen 2006; Andersen and Svarer 2007; Andersen 2015). Under this institutional model, labor-market security is achieved primarily through income support, worker retraining, and collective bargaining rather than government restrictions on occupational entry. The comparatively low occupational licensing prevalence observed in the Nordic countries is therefore consistent with a broader labor-market model that emphasizes worker mobility and labor-market flexibility while protecting workers through social insurance rather than occupational regulation.

Taken together, these comparisons suggest that occupational licensing should not be viewed as a uniform institution with a single underlying cause. Similar licensing rates may emerge from very different institutional environments. In some countries, extensive licensing may accompany broader systems of administrative regulation and formal-sector entry barriers. In others, it may complement coordinated labor-market institutions built around vocational training, collective bargaining, and worker representation. Conversely, relatively low occupational licensing need not imply lightly regulated labor markets, since labor-market protections can instead be provided through collective bargaining, employment protections, active labor-market policies, or social insurance. The cross-country variation documented in Figure 2 therefore appears to reflect important differences in how countries organize labor-market institutions rather than simply differences in the overall degree of labor-market regulation.

The United States sits squarely in the upper-middle of the cross-country distribution at 28.0%, between Ireland (29.3%) and Colombia (27.9%). Other anglophone economies span a wide range: Australia is the third most heavily licensed country in our sample at 39.4%, while Ireland (29.3%) and New Zealand (27.0%) are near the U.S. level, the United Kingdom comes in below at 19.5%, and Canada lies between at 25.1%. The fact that four of the largest English-speaking labor markets occupy such different positions in the distribution underscores that high incomes and similar legal traditions do not, on their own, determine the prevalence of occupational licensing.

The newly surveyed Latin American economies likewise span a wide range of licensing intensities. Chile is the most licensed at 32.3%, followed by Peru (29.9%), Colombia (27.9%), Mexico (25.7%), Brazil (24.0%), and Argentina (18.5%). Importantly, all six fall comfortably within the band documented for advanced economies, and several—Chile, Peru, and Colombia—lie above the U.S. share. This is consistent with the conclusion we draw throughout the paper: occupational licensing is not a uniquely high-income institution, and treating it as such has likely understated its global reach.

At the other end of the distribution, the least heavily licensed countries are concentrated in Northern and Southern Europe. Denmark (14.0%), Latvia (15.1%), Sweden (15.3%), France (16.0%), Portugal (16.5%), Spain (16.6%), Belgium (16.6%), and Finland (16.7%) all report licensed shares below the United Kingdom. The combination of Nordic and Mediterranean countries at the bottom of the distribution is consistent with the long-standing observation that European labor market regulation is more often expressed through collective bargaining coverage, statutory employment protection, and broad occupational regulation by professional bodies than through individual government-issued

licenses of the U.S. type.

Across all 44 countries, the simple unweighted mean of the licensed share is approximately 24.6%, with a median of roughly 24.2%. Put differently, the typical country in our sample has between one-in-four and one-in-five of its formal-sector workers in a job that legally requires a government-issued license; remarkably close to the figure long emphasized in the U.S. licensing literature (Kleiner and Krueger 2013). The principal contribution of Figure 2 is therefore not that any single country looks unusual, but that the central tendency and the spread of licensing rates are broadly comparable across a far wider set of countries than has previously been documented, and that several developing and middle-income economies are situated at the very top of the cross-country distribution rather than the bottom.

Figure 3 provides a geographic visualization of occupational licensing prevalence across the countries in our sample. Several regional patterns emerge. Occupational licensing rates are particularly high in India, South Africa, Australia, and parts of Central and Eastern Europe, while many Nordic and Western European countries exhibit substantially lower licensing prevalence. Latin America displays considerable heterogeneity, with Chile, Peru, and Colombia exhibiting relatively high licensing rates compared to Argentina. The figure highlights that occupational licensing is not concentrated in any single region of the world and instead appears across countries with diverse legal traditions, levels of economic development, and labor market institutions.

Figure 4 examines the relationship between occupational licensing prevalence and GDP per capita across countries. The figure reveals a modest negative cross-sectional relationship between licensing rates and income levels, driven in part by several developing and middle-income economies with exceptionally high rates of occupational licensing. India and South Africa, for example, combine some of the highest licensing shares in the sample with substantially lower GDP per capita levels than advanced OECD economies. By contrast, several high-income Northern European economies such as Denmark and Sweden exhibit relatively low licensing prevalence despite high income levels.

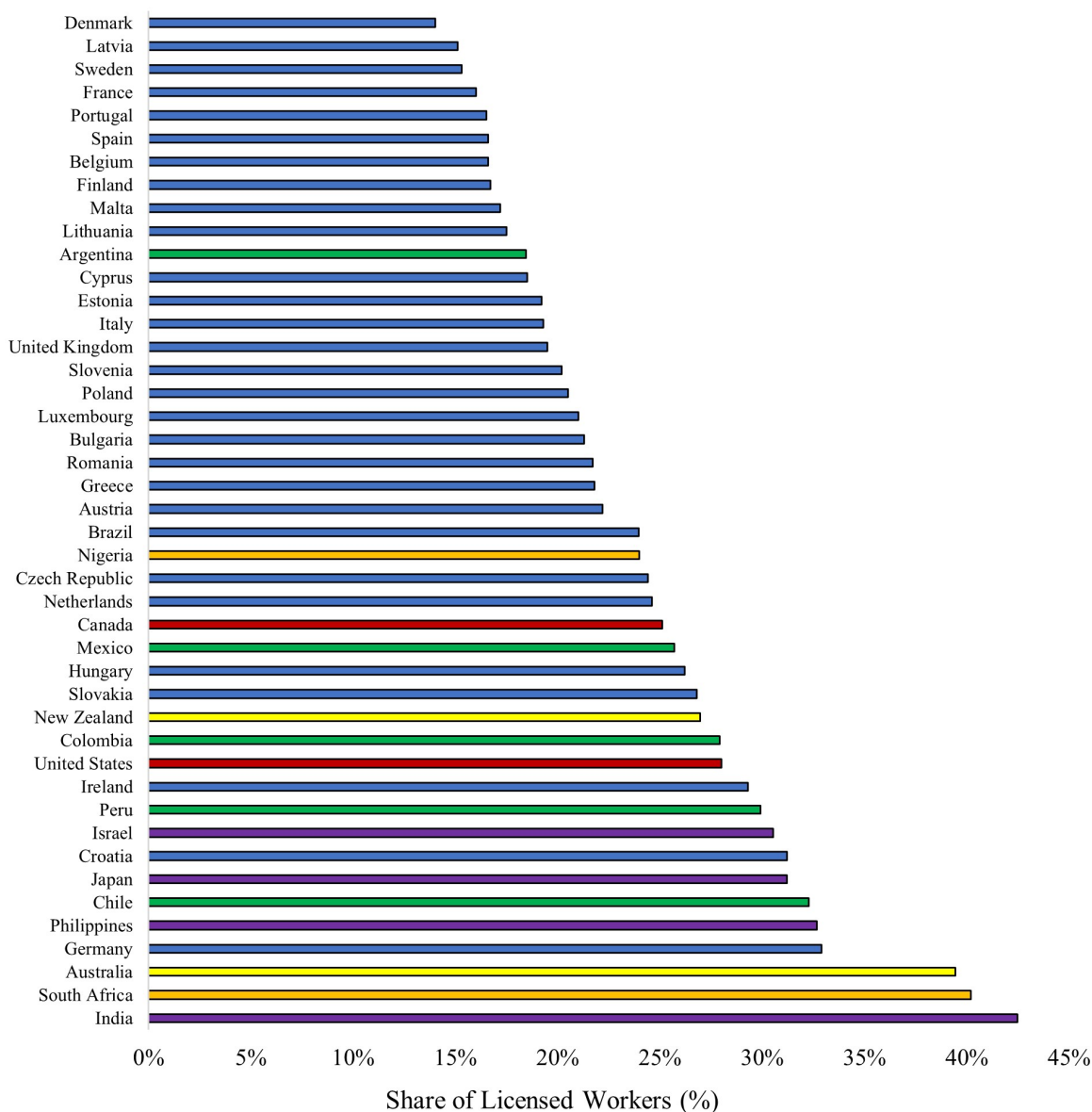
At the same time, the relationship is far from deterministic. A number of wealthy economies, including Australia and the United States, maintain comparatively high levels of occupational licensing, while some middle-income economies such as Argentina exhibit lower licensing prevalence. Taken together, the evidence suggests that occupational licensing is not simply a byproduct of economic development or state capacity, but instead reflects broader differences in legal institutions, labor market regulation, professional governance, and political economy across countries.

The negative relationship is consistent with several possible interpretations. One possibility is that occupational licensing is associated with lower labor market dynamism, reduced worker mobility, and weaker productivity growth through barriers to occupational entry. Alternatively, countries with lower income levels may adopt more extensive occupational regulation for political-economy reasons, or both licensing prevalence and economic development may be jointly determined by broader institutional characteristics. Because the analysis is cross-sectional and observational, these relationships should be interpreted as descriptive correlations rather than causal estimates.

3.2 Occupational Licensing and Informality

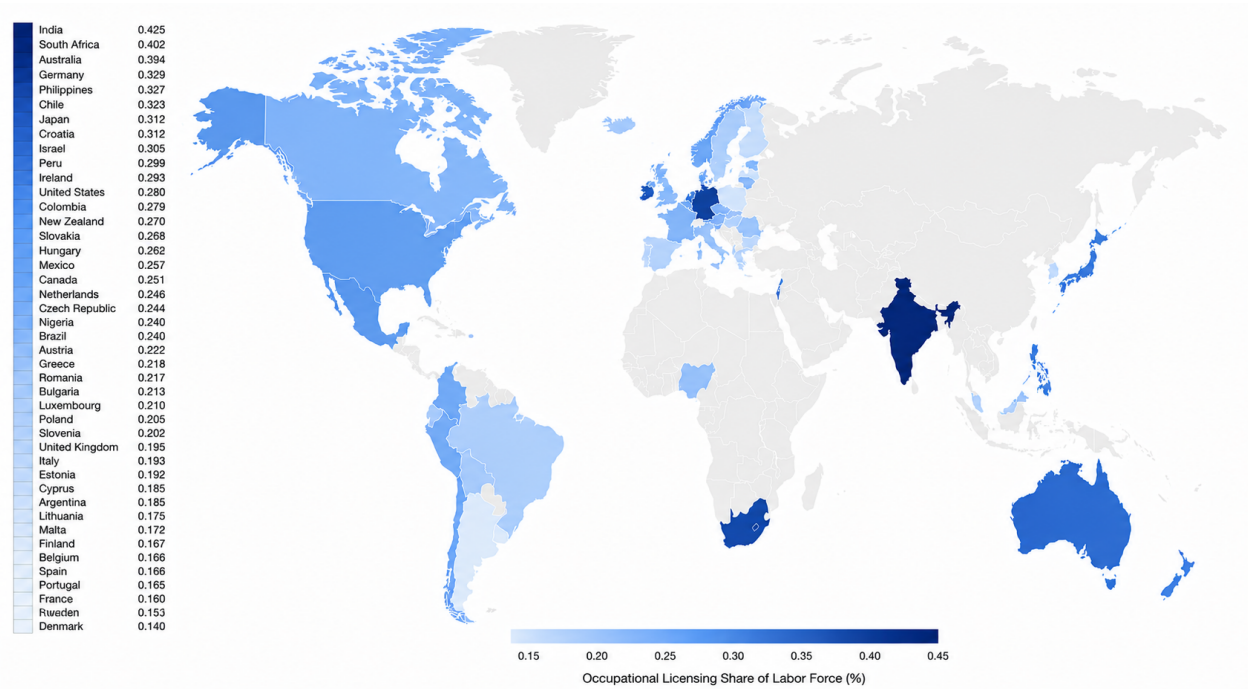
Figure 5 examines the relationship between occupational licensing prevalence and informal employment across countries. A positive cross-sectional relationship emerges: countries with higher occupational licensing rates also tend to exhibit larger informal sectors. Several of the most heavily licensed countries in our sample, including India, South Africa, Peru, Colombia, and Mexico, also report relatively high levels of informal employment. By contrast, many

Figure 2: Proportion of Labor Force With Occupational License Across Nations



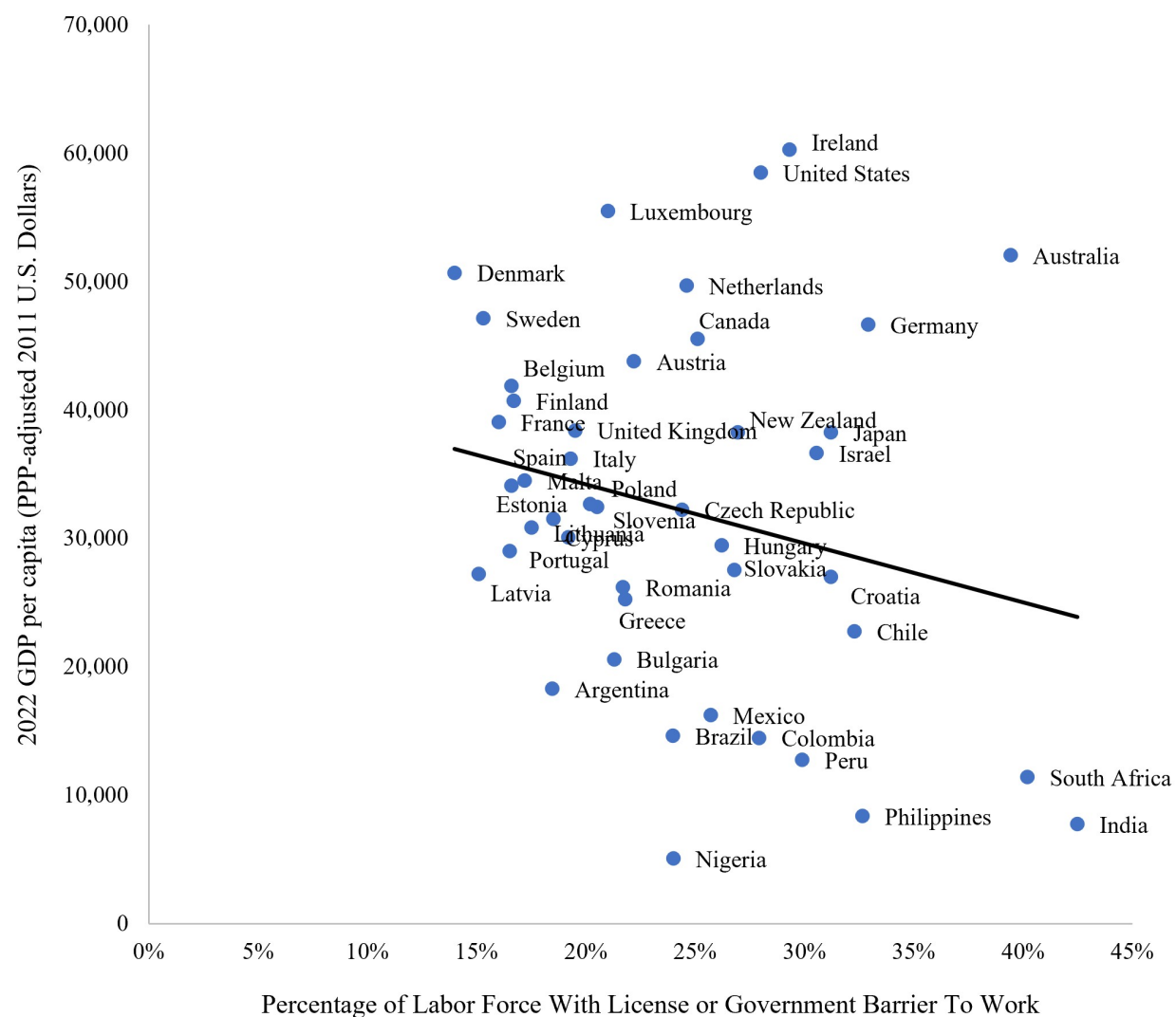
Notes: This figure reports the share of workers whose occupation legally requires a government-issued license across 44 countries. Estimates are derived from nationally representative surveys and harmonized to follow the occupational licensing framework of [Kleiner and Krueger \(2013\)](#), which distinguishes legally required occupational licenses from voluntary certifications. For the United States, estimates are based on [Kleiner and Krueger \(2013\)](#) and related CPS licensing supplements; European estimates are drawn from [Koumenta and Pagliero \(2019\)](#); Japanese estimates are from [Morikawa \(2018\)](#); and all remaining countries are based on original nationally representative surveys conducted by the authors between 2024 and 2026. Survey responses are reweighted using IPUMS population benchmarks for age, gender, and educational attainment to improve national representativeness. Countries are grouped by region for visual presentation only. Values represent the proportion of workers employed in occupations requiring a government-issued occupational license.

Figure 3: Occupational Licensing Share of Labor Force Across Nations



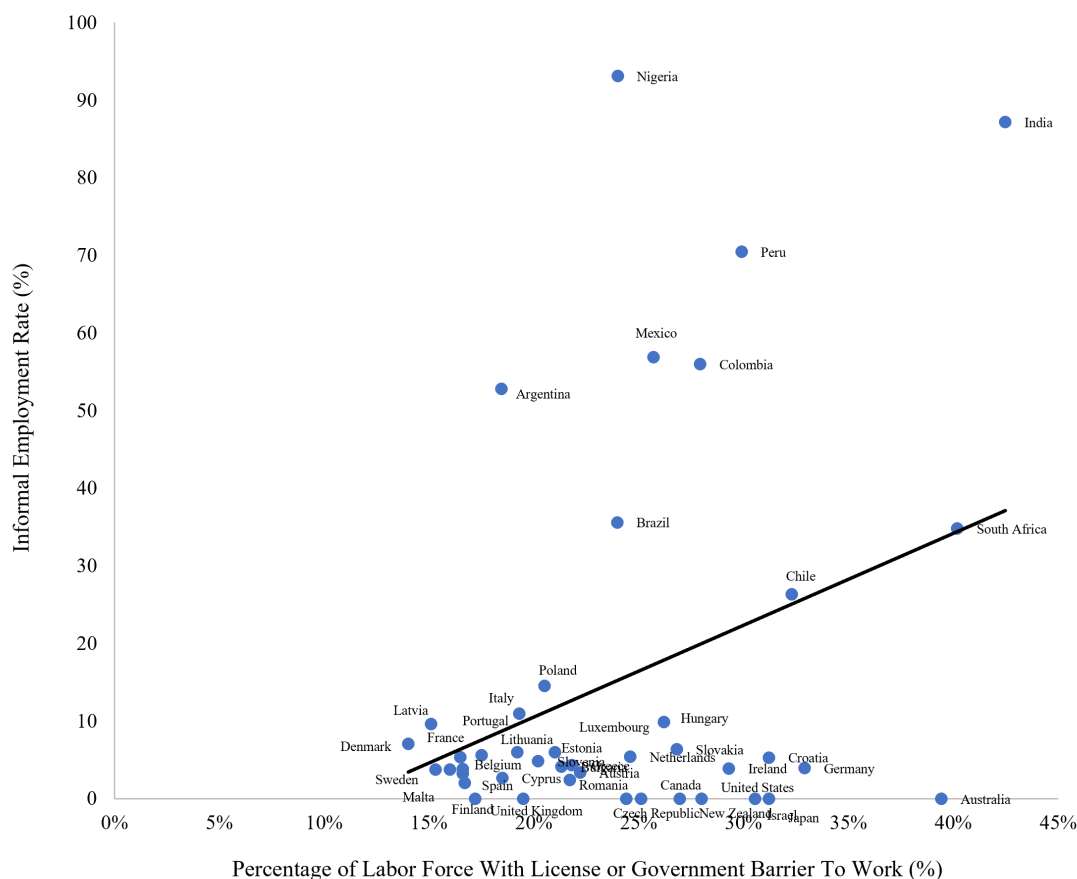
Notes: This figure presents the share of the labor force employed in occupations requiring a government-issued occupational license across countries in the sample. Licensing estimates are based on nationally representative surveys harmonized to follow the occupational licensing definitions of [Kleiner and Krueger \(2013\)](#), with post-stratification reweighting using IPUMS population benchmarks. Darker shading indicates a larger share of workers employed in licensed occupations. Countries shown in gray are not included in the sample.

Figure 4: GDP Per Capita Versus Proportion of Labor Force With Occupational Licenses Across Nations



Notes: This figure plots occupational licensing prevalence against GDP per capita from the Maddison Project Database 2023 release. GDP per capita is measured in PPP-adjusted international dollars. Licensing estimates are based on nationally representative survey data harmonized to follow the occupational licensing definitions of [Kleiner and Krueger \(2013\)](#), with post-stratification reweighting using IPUMS population benchmarks. The fitted line represents the unweighted cross-country linear relationship between licensing prevalence and GDP per capita.

Figure 5: Occupational Licensing and Informal Employment Across Nations



Notes: This figure plots the share of the labor force employed in occupations requiring a government-issued occupational license against the informal employment rate. Informal employment data are obtained from ILOSTAT's Sustainable Development Goal indicator 8.3.1 (Informal Employment Rate). Licensing estimates are based on nationally representative surveys harmonized to follow the occupational licensing definitions of [Kleiner and Krueger \(2013\)](#), with post-stratification reweighting using IPUMS population benchmarks. The Philippines is excluded because a corresponding ILOSTAT informal employment estimate was unavailable. Several advanced economies not covered in the ILOSTAT informal employment database (including Australia, Japan, Israel, Malta, New Zealand, the United Kingdom, the United States, and the Czech Republic) are coded as having zero percent informal employment. The fitted line represents the unweighted cross-country linear relationship between occupational licensing prevalence and informal employment.

Northern and Western European countries combine comparatively low occupational licensing rates with very small informal sectors.

Informality estimates are drawn from the ILOSTAT Informal Employment Rate database (SDG Indicator 8.3.1). Coverage is more complete for developing and emerging economies than for advanced economies. The Philippines was excluded because a corresponding informality estimate was unavailable. Several advanced economies—including Australia, Japan, Israel, Malta, New Zealand, the United Kingdom, the United States, and the Czech Republic—are not included in the ILOSTAT database and are therefore coded as having zero percent informal employment. Consequently, the positive relationship in [Figure 5](#) should be interpreted as descriptive rather than definitive, particularly at the lower end of the informality distribution where data limitations are more pronounced.

At first glance, this relationship may appear paradoxical. Occupational licensing is often viewed as a feature of highly regulated formal labor markets, whereas informal employment is typically associated with weak enforcement and limited state capacity. However, several mechanisms could generate the positive correlation observed in [5](#).

One possibility is that occupational licensing contributes directly to informality. By raising the cost of entering regulated occupations through educational requirements, examinations, fees, and administrative hurdles, licensing may exclude some workers from formal employment opportunities. Workers unable or unwilling to satisfy licensing requirements may instead operate in informal markets. This mechanism is closely related to the broader argument of [de Soto \(1989\)](#), who emphasized how regulatory barriers can push economic activity outside the formal sector when compliance costs become sufficiently burdensome.

A second possibility is reverse causality. Countries with large informal sectors may respond by creating additional licensing requirements in an attempt to improve consumer protection, raise professional standards, increase tax compliance, or formalize economic activity. Under this interpretation, high informality leads to greater occupational regulation rather than the reverse.

A third possibility is that both occupational licensing and informality are jointly determined by deeper institutional characteristics. Countries with more interventionist regulatory traditions may simultaneously impose greater occupational licensing requirements while also maintaining labor market regulations that encourage informality. Alternatively, weaker institutional environments may generate both extensive licensing rules on paper and lower levels of enforcement in practice, resulting in a combination of high measured licensing prevalence and large informal sectors.

While [Figure 5](#) does not establish causality, the positive relationship is consistent with the view that occupational licensing may influence labor market outcomes through channels extending beyond wages alone. In developing and middle-income economies, where informal employment often accounts for a substantial share of economic activity, licensing requirements may affect occupational choice, worker mobility, and the allocation of labor between the formal and informal sectors. Understanding these interactions represents an important direction for future research.

3.3 Occupational Licensing and Governance

[Figure 6](#) examines the relationship between occupational licensing prevalence and the six World Bank Worldwide Governance Indicators. Across all six measures—Voice and Accountability, Political Stability, Government Effectiveness, Regulatory Quality, Rule of Law, and Control of Corruption—countries with higher occupational licensing rates tend to have lower governance scores. The negative slopes are especially visible for Voice and Accountability, Political Stability, Regulatory Quality, Rule of Law, and Control of Corruption, while the relationship with Government Effectiveness is

weaker but still negative.

These patterns provide additional evidence that occupational licensing is not simply a feature of high-capacity or highly developed states. If licensing primarily reflected administrative sophistication or stronger state capacity, one might expect more licensing in countries with stronger governance institutions. Instead, the cross-country relationship points in the opposite direction: countries with higher measured licensing prevalence often have weaker governance environments.

Because governance quality and licensing prevalence are jointly determined at the country level, these relationships should not be interpreted as evidence that occupational licensing causes weaker governance outcomes. One interpretation is that licensing may function differently across institutional settings. In countries with strong rule of law and high regulatory quality, licensing requirements may be more narrowly targeted toward occupations with clear health, safety, or consumer-protection rationales. In countries with weaker governance institutions, by contrast, licensing may reflect broader barriers to entry, professional rent-seeking, administrative discretion, or attempts to regulate labor markets through formal rules that are unevenly enforced in practice.

A second interpretation is that occupational licensing and weak governance are jointly determined by deeper political-economy forces. Countries with more discretionary or interventionist regulatory systems may both impose more occupational barriers and score lower on measures of regulatory quality, rule of law, and corruption control. Under this view, occupational licensing may be one manifestation of a broader institutional environment in which access to formal economic activity is more heavily mediated by the state.

As with the GDP per capita and informality figures, these relationships should be interpreted as descriptive rather than causal. Nevertheless, the governance patterns reinforce one of the paper’s central findings: occupational licensing is not merely an advanced-economy labor-market institution. It is also prevalent in countries where governance is weaker, informality is higher, and regulatory barriers may interact more strongly with labor-market dualism and economic misallocation.

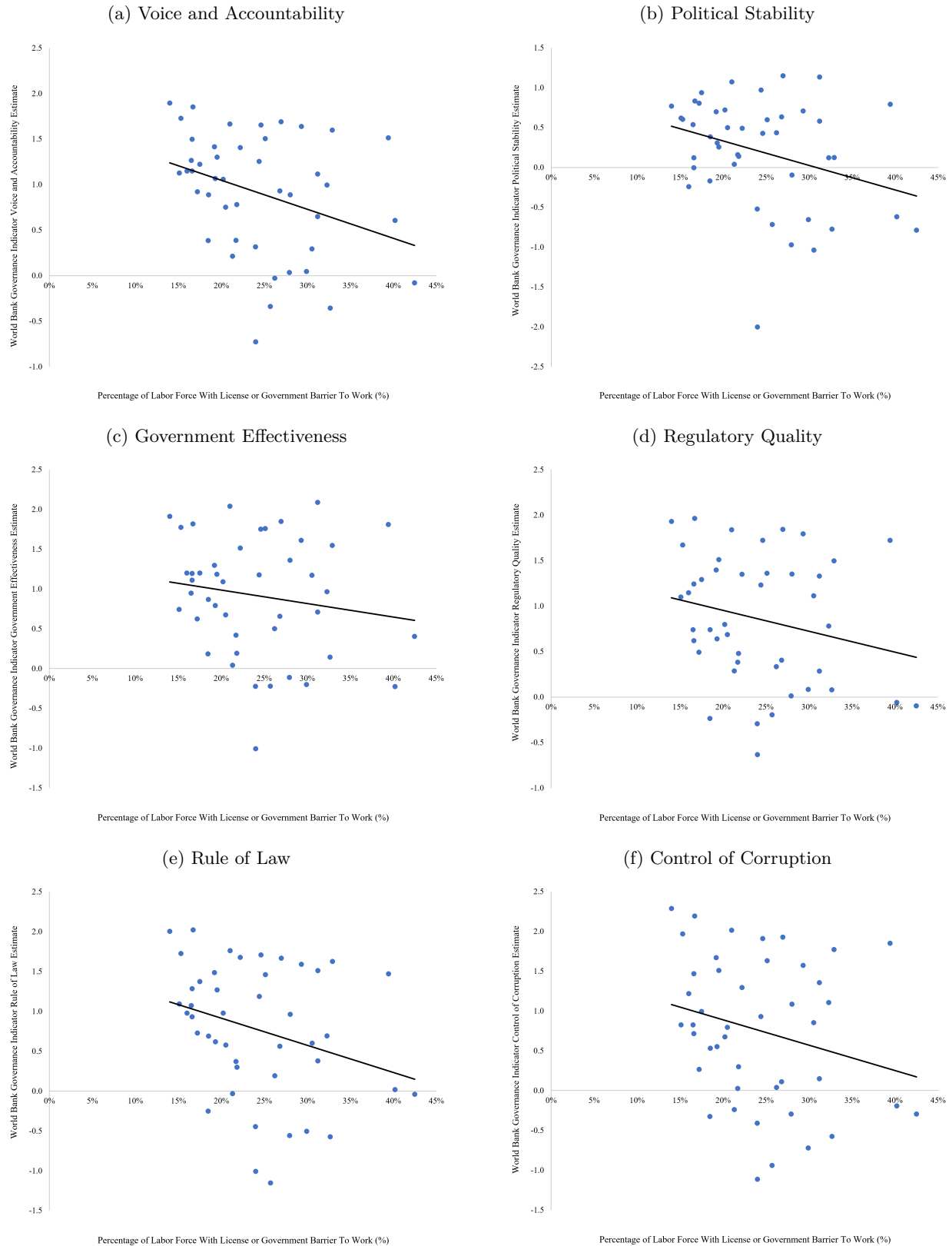
3.4 Licensing and Wages

We now turn to the empirical relationship between licensing and wages in our cross-national sample. All regressions reported in this section are estimated on the pooled survey data using within-country sampling weights, so that workers within each country are weighted to their respective national populations while each country receives equal weight in the pooled estimation. This weighting scheme prevents the pooled estimates from being mechanically dominated by the countries with the largest survey samples.

3.4.1 Pooled Mincerian wage regressions: unweighted and weighted estimates

Table 1 and Table 2 report estimates from the pooled Mincerian wage regressions in equation (1). Table 1 reports estimates using the pooled survey sample without demographic reweighting, while Table 2 applies the IPUMS-based post-stratification weights described above. Across both tables, Column (1) reports a simple bivariate specification regressing wages on licensing status. Column (2) adds certification status and standard Mincerian controls (education, age, and age squared). Column (3) adds country fixed effects. Column (4) further controls for wage reporting units, hours worked per week, and weeks worked per year. Column (5) adds additional worker and job characteristics including gender, union status, public-sector employment, type of work, and tenure.

Figure 6: Occupational Licensing and World Bank Governance Indicators Across Nations



Notes: This figure plots the share of the labor force employed in occupations requiring a government-issued occupational license against each of the six World Bank Worldwide Governance Indicators: Voice and Accountability, Political Stability, Government Effectiveness, Regulatory Quality, Rule of Law, and Control of Corruption. Licensing estimates are based on nationally representative surveys harmonized to follow the occupational licensing definitions of [Kleiner and Krueger \(2013\)](#), with post-stratification reweighting using IPUMS population benchmarks. Governance indicators are measured in standard normal units, with higher values indicating stronger governance outcomes. The fitted lines represent unweighted cross-country linear relationships.

Across both weighted and unweighted specifications, occupational licensing is associated with positive wage premia ranging from roughly 6 to 19 percent depending on the specification. Our preferred specification implies a licensing wage premium of approximately 19 percent. This estimate is broadly consistent with the range reported in the U.S. occupational licensing literature and somewhat larger than the average estimates reported for Europe. The estimated premium becomes positive and statistically significant once country fixed effects are introduced and remains relatively stable across the richer specifications. These estimates are broadly consistent with the 10–15 percent licensing wage premium reported by [Kleiner and Krueger \(2013\)](#) for the United States and somewhat larger than the average wage effects reported by [Koumenta and Pagliero \(2019\)](#) for the European Union.

These wage differences may also reflect the concentration of licensed employment in the public sector, where licensing prevalence is substantially higher than in the private sector ([Kleiner and Wang \(2026\)](#)).

The weighted estimates in [Table 2](#) are more conservative but point in the same direction. Once country fixed effects are introduced, the coefficient on occupational licensing remains positive across specifications, although the estimated premium declines as additional controls are added and becomes statistically insignificant in the fully specified model. This pattern suggests that part of the estimated licensing premium reflects differences in the demographic and occupational composition of survey respondents. Because the weighted estimates incorporate post-stratification adjustments using nationally representative IPUMS benchmarks, they may provide a more representative estimate of the average licensing premium across countries.

Taken together, the results suggest that occupational licensing is generally associated with higher earnings across countries, consistent with a large literature documenting wage premiums for licensed workers ([Kleiner and Krueger, 2013](#); [Gittleman et al., 2018](#); [Koumenta and Pagliero, 2019](#)). While the magnitude of the estimated premium is sensitive to demographic reweighting and specification choice, the overall evidence remains consistent with the view that occupational licensing is associated with higher wages, potentially reflecting a combination of barriers to entry, economic rents, occupational commitment, signaling, and human capital accumulation.

Because the newly collected surveys are reweighted to match national demographic distributions using IPUMS population benchmarks, estimated licensing wage premiums differ somewhat between weighted and unweighted specifications. The divergence largely reflects differences in the demographic and occupational composition of respondents across countries. Reweighting increases the representation of workers in demographic groups that are underrepresented in the raw survey samples and therefore changes the composition of licensed and unlicensed workers. Importantly, the qualitative conclusion that licensed workers earn higher wages remains robust across both weighted and unweighted specifications.

3.5 Control Sensitivity and Bounding a Causal Effect

When using multivariate regressions to estimate causal effects, even with robust controls, it is still likely that the remaining unobserved variable may bias the results. The methods first developed by [Altonji et al. \(2005\)](#) and further developed by [Oster \(2019\)](#) allow us to bound the causal estimates of the effects of licensure on wages, by observing how both the coefficient on licensed and the amount of unexplained variance (as measured by R^2) change when adding additional covariates.

Let $\tilde{\beta}$ be the fully-specified coefficient on licensed, $\circ\beta$ be the naive coefficient, and β^* be the true coefficient. Let $\tilde{R}$ be the fully specified R^2 and $\circ R$ be the naive R^2 , and R_{max} be an assumed maximum possible R^2 given the

Table 1: Mincerian Wage Regressions, Pooled Sample (Unweighted)

VARIABLES	(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 4	(5) Model 5
Licensed	-0.1619*** (0.0224)	-0.2462*** (0.0227)	0.2112*** (0.0164)	0.2067*** (0.0165)	0.1867*** (0.0194)
Certified		-1.2380*** (0.0338)	0.0859*** (0.0255)	0.0758 (0.0491)	0.0608 (0.0435)
Education Years		-0.0118*** (0.0034)	0.0559*** (0.0025)	0.0572*** (0.0057)	0.0607*** (0.0054)
Age		0.0000 (0.0000)	0.0000*** (0.0000)	0.0000*** (0.0000)	0.0000*** (0.0000)
Age Squared		-0.0000 (0.0000)	-0.0000*** (0.0000)	-0.0000*** (0.0000)	-0.0000*** (0.0000)
Country Fixed Effects	No	No	Yes	Yes	Yes
Time Unit Controls	No	No	No	Yes	Yes
Worker Controls	No	No	No	No	Yes

Notes: Dependent variable is log wages. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.10.

Table 2: Mincerian Wage Regressions, Pooled Sample (IPUMS Reweighted)

VARIABLES	(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 4	(5) Model 5
Licensed	-0.6674** (0.2999)	-0.8243*** (0.3072)	0.3176 (0.2477)	0.2817 (0.2202)	0.0610 (0.2268)
Certified		-0.4261 (0.2926)	0.3143 (0.2623)	0.1886 (0.2219)	0.0524 (0.2060)
Education Years		0.0423 (0.0500)	0.0332 (0.0367)	0.0523 (0.0311)	0.0569 (0.0344)
Age		0.2611*** (0.0516)	0.0374 (0.0468)	0.0415 (0.0589)	0.0291 (0.0596)
Age Squared		-0.0025*** (0.0006)	-0.0004 (0.0005)	-0.0004 (0.0007)	-0.0002 (0.0007)
Country Fixed Effects	No	No	Yes	Yes	Yes
Time Unit Controls	No	No	No	Yes	Yes
Worker Controls	No	No	No	No	Yes

Notes: Dependent variable is log wages. Regressions use IPUMS demographic post-stratification weights. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.10.

context, with Oster recommending $1.3 * \tilde{R}$. Additionally, let δ be the assumed proportion of selection bias explained by observable covariates to the the selection bias explained by unobservable covariates, with Oster recommending $\delta = 1$. As Oster explains, we can use these assumed parametes to calculate a bias-adjusted treatment effect,

$$\beta^* \approx \tilde{\beta} - \delta[\circ\beta - \tilde{\beta}] \frac{R_{max} - \tilde{R}}{\tilde{R} - \circ R}$$

Table 3 presents the results of this exercise, using the results from models 1 and 5 in Table 2. Each column shows the bounds of possible causal results based on this method. We assume $\delta = 1$, and test various R_{max} values in each column, with $R_{max} = 1$ providing the most conservative estimate. The presented result is a range of potential estimates of β^* . Note that our naive estimate has a very small R^2 , and the result is unrealistic based on the theory. Additionally, we present the δ necessary to estimate a β^* of 0 under each assumed R_{max} .

Assuming a δ of 1, we can expect the true value of the coefficient on licensing to be greater than 0.0610, potentially much greater than 0.0610. Assuming a δ of 1 is the same as assuming a linear relationship between bias and the explained variation. This may be an unrealistic assumption, as shown in Table 2, this relationship can be nonlinear. Under each assumed value of R_{max} , the δ would have to be negative, meaning the directionality of the remaining selection bias would have to be opposite as the selection bias explained by model 5.

Table 3: Control Sensitivity and Treatment Effect Bounds

$\circ\beta$ ($\circ R$)	$\tilde{\beta}$ ($\tilde{R}$)	R_{max}			
		0.40	$1.3 \times \tilde{R} = 0.4698$	0.70	1.00
-0.6674 (0.0021)	0.0610 (0.3614)	[0.0610, 0.1393]	[0.0610, 0.2806]	[0.0610, 0.7474]	[0.0610, 1.3556]
	$\delta =$	-0.7795	-0.2776	-0.0889	-0.0471

3.5.1 Heterogeneity by OECD Membership

Table 4 compares wage regressions estimated separately on OECD and non-OECD countries. In both samples, the licensing coefficient is positive but statistically insignificant. The point estimate is somewhat larger in the non-OECD sample than in the OECD sample, although the difference is not statistically distinguishable from zero. These results suggest that the positive licensing premium observed in the pooled regressions is not driven exclusively by either OECD or non-OECD countries. The estimated returns to education and tenure are stronger in the non-OECD sample, while the gender wage gap is larger and more precisely estimated in the OECD sample. Despite differences in the structure of labor markets across these groups, the estimated relationship between licensing and wages is positive in both samples but imprecisely estimated once the full set of Mincerian and job-related controls is included.

Table 4: Mincerian Wage Regressions by OECD Membership

VARIABLES	(1) OECD	(2) Non-OECD
Licensed	0.0743 (0.2317)	0.2870 (0.5658)
Certified	-0.0758 (0.2262)	0.6984 (0.5277)
Years of education	0.0584** (0.0286)	0.1384* (0.0759)
Age	0.0957** (0.0483)	0.0160 (0.1077)
Age ²	-0.0009* (0.0006)	-0.0001 (0.0012)
Hours per week	-0.0053 (0.0125)	-0.0479** (0.0197)
Female	-0.7476*** (0.1785)	-0.6533 (0.4371)
Union member	0.3097 (0.2135)	1.4536*** (0.5137)
Constant	-4.9743*** (1.2909)	0.1446 (3.2892)
Wage period FE	Yes	Yes
Country FE	Yes	Yes
Sector (Pub/Priv) FE	Yes	Yes
Type of work FE	Yes	Yes
Observations	12,533	3,192
R-squared	0.3633	0.3392

Notes: Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The dependent variable is the natural logarithm of the harmonized wage measure constructed from the underlying occupational licensing surveys. Countries are classified according to current OECD membership. Country, sector, type-of-work, and wage-period fixed-effect coefficients are not reported.

3.6 Further Discussion of the Wage Results

Three broad conclusions emerge from the wage regressions. First, the pooled regressions provide evidence of a positive occupational licensing wage premium across countries. Second, the estimated premium is sensitive to specification and becomes substantially larger once country fixed effects are introduced, suggesting that cross-country differences mask important within-country relationships between licensing and earnings. Third, while the pooled estimates are statistically significant, the OECD and non-OECD subsamples reveal substantial heterogeneity and much larger standard errors, indicating that the magnitude of licensing premia varies across institutional environments.

A broader interpretation of these results is that occupational licensing may operate differently across institutional environments than in the canonical U.S. setting emphasized in much of the existing literature. In advanced economies with relatively high levels of formal-sector compliance and stronger enforcement of occupational regulations, licensing may more directly restrict labor supply and generate observable wage premia for incumbent workers. By contrast, in many developing and middle-income economies, licensing requirements may coexist with large informal sectors, uneven regulatory enforcement, and lower levels of worker compliance. In such environments, licensing may still create substantial barriers to entry and distort labor allocation even if the resulting wage premia are not fully reflected in formal-sector earnings regressions.

This interpretation is consistent with the finding that several developing economies in our sample exhibit some of the highest licensing rates in the world despite comparatively weak estimated licensing wage premia. The principal economic effects of licensing in these settings may therefore operate through margins other than measured wages, including reduced labor mobility, lower formal-sector employment, occupational misallocation, and higher consumer prices for regulated services. More generally, the results suggest that the welfare consequences of occupational licensing cannot be inferred solely from estimated wage premia, particularly in countries where large shares of economic activity occur outside the fully regulated formal sector.

3.7 Interpretation of Licensing Wage Premia

In principle, any association between licensing and wages may reflect two non-mutually exclusive mechanisms. First, licensing may restrict labor supply by raising entry costs, thereby generating economic rents for incumbent workers. Second, licensing requirements may increase human capital by mandating additional education or training, in which case part of any observed wage premium reflects higher productivity rather than pure rents.

In our cross-national sample, the pooled within-country Mincerian estimates point to a positive and statistically significant licensing wage premium. The fully specified pooled regression implies that licensed workers earn approximately 19 percent higher wages than comparable unlicensed workers. While the OECD and non-OECD subsamples yield positive but statistically insignificant coefficients, the pooled results suggest that occupational licensing is associated with economically meaningful earnings differences across countries.

Several factors may help explain differences between our estimates and those reported elsewhere in the occupational licensing literature. First, our regressions absorb a substantial amount of variation through country and sector fixed effects, which is essential for cross-country comparability but may also remove some of the between-occupation variation that drives licensing premia in single-country studies. Second, the wage measure available in our surveys is harmonized at the cost of measurement error, particularly for self-employed and informal workers. Third, the legal force of licensing requirements differs across countries: in many of the developing-country settings in our sample, the gap between de jure licensing rules and de facto enforcement may be substantial, which would mechanically attenuate the estimated coefficient on the licensing indicator.

In developing-country contexts, these considerations may have especially important implications. If licensing raises entry costs without generating large wage premia for incumbents, the principal welfare consequence may operate through restricted entry, higher consumer prices, and the expansion of informal employment rather than through visibly higher wages in the formal sector. The lack of a wage premium for licensing may reflect that consumers are unwilling to pay more for licensed services ((Kleiner and Soltas 2023)). Licensing may thus simultaneously protect insiders and disadvantage marginal workers, amplifying labor market dualism, even when the average wage gap between licensed and unlicensed workers within a country is modest.

Taken together, the evidence presented in this section paints a consistent picture of occupational licensing as an important labor market institution across countries. First, occupational licensing is widespread throughout the world and is not confined to advanced economies; several developing and middle-income countries exhibit licensing rates that equal or exceed those observed in the United States and Europe. Second, countries with more extensive occupational licensing tend to exhibit lower GDP per capita, higher informal employment, and weaker governance outcomes, although these relationships are descriptive rather than causal. Third, licensed workers generally earn wage

premiums ranging from roughly 6 to 19 percent depending on specification than comparable unlicensed workers across a wide range of specifications, consistent with the broader occupational licensing literature. Collectively, these findings suggest that occupational licensing is intertwined with broader labor market institutions and patterns of economic development, highlighting the importance of expanding comparative research beyond the advanced economies that have traditionally dominated the occupational licensing literature.

4 Conclusion

This paper provides new cross-national evidence on the prevalence and labor market correlates of occupational licensing using newly collected and reweighted survey data alongside existing evidence from advanced economies. Across 44 countries, we find that occupational licensing is a pervasive feature of modern labor markets. The typical country in our sample licenses roughly one-quarter of its workforce, and the cross-country distribution exhibits substantial variation, ranging from roughly 14 percent in Denmark to more than 40 percent in India.

One of the paper’s central findings is that several developing and middle-income economies exhibit licensing rates that are as high as, or higher than, those observed in the United States and Europe. India, South Africa, the Philippines, and Chile all rank among the most heavily licensed labor markets in our sample. These findings challenge the common implicit assumption that occupational licensing is primarily a feature of wealthy advanced economies. Instead, occupational licensing appears to be a globally widespread labor market institution whose prevalence spans countries with very different legal systems, income levels, and regulatory traditions.

An additional contribution of the paper is to document that occupational licensing is systematically related to broader measures of economic and institutional performance. Countries with higher licensing prevalence tend to exhibit lower GDP per capita, larger informal sectors, and lower scores on multiple dimensions of governance quality, including regulatory quality, rule of law, political stability, and control of corruption. These patterns suggest that occupational licensing may often operate as part of a broader regulatory environment rather than as an isolated labor-market institution. However, the cross-sectional relationships documented in this paper are descriptive and do not establish causal effects of occupational licensing on economic performance, informality, or governance.

Taken together, the GDP, informality, and governance correlations suggest that occupational licensing may be embedded within a broader institutional syndrome rather than functioning as an isolated labor-market policy. Countries with higher licensing prevalence tend simultaneously to be poorer, exhibit larger informal sectors, and score lower on measures of governance quality. One interpretation is that extensive occupational licensing reflects a broader regulatory environment characterized by greater barriers to formal economic participation. Under this view, licensing may contribute to labor-market dualism and economic misallocation by making entry into formal occupations more difficult, particularly in developing economies where workers can more readily shift into informal employment.

Our wage regressions provide evidence of a positive occupational licensing wage premium across countries. In pooled specifications with extensive controls, licensed workers earn approximately 19 percent higher wages than comparable unlicensed workers. While these estimates are less precisely estimated within OECD and non-OECD subsamples, the overall pattern is broadly consistent with the existing occupational licensing literature documenting higher earnings among licensed workers.

These results suggest that the welfare consequences of occupational licensing may operate differently across countries and institutional environments. In settings where licensing raises barriers to entry but does not generate large

observable wage premia, the principal effects may instead occur through reduced labor market access, diminished worker mobility, higher consumer prices, and the expansion of informal employment. This possibility may be particularly important in developing economies, where the distinction between formal and informal labor markets is often central to economic organization.

Several limitations of the analysis are worth noting. While our surveys are nationally representative after reweighting, they focus primarily on the formal sector, and enforcement of licensing requirements may vary across countries and occupations. As a result, our estimates capture de facto licensing among workers who report holding required credentials, rather than the full scope of de jure regulation. Future research could explore the gap between legal licensing requirements and actual enforcement, particularly in settings with large informal sectors.

The correlations documented in this paper are consistent with several possible mechanisms. One possibility is that occupational licensing directly contributes to lower economic performance by raising barriers to entry, reducing labor mobility, and encouraging some workers to operate in the informal sector. A second possibility is reverse causality: countries with lower income levels, weaker governance institutions, or larger informal sectors may adopt additional licensing requirements in an effort to improve quality, increase compliance, or formalize economic activity. A third possibility is that occupational licensing, informality, governance quality, and economic development are jointly determined by deeper institutional characteristics, such as state capacity, regulatory traditions, or political incentives that shape the degree of government involvement in labor markets. Distinguishing among these mechanisms remains an important task for future research.

More broadly, this paper highlights the need for improved international data on occupational regulation. The absence of comparable cross-country evidence has likely led researchers and policymakers to understate the global reach of occupational licensing and its potential effects on labor market allocation and economic development. Extending similar survey efforts to additional countries and over time would allow future work to better understand how licensing interacts with informality, migration, worker mobility, and long-run growth across different institutional settings. The efforts of other nations to develop a time series of data on occupational licensing similar to the U.S. would enhance our ability to gauge the optimal level of regulation in each nation.

More broadly, our findings suggest that occupational licensing should be viewed as a comparative political economy institution whose prevalence reflects broader differences in how countries organize labor markets, regulate professions, and allocate economic opportunity.

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A Country-Level Data Sources

Table A1 reports the underlying occupational licensing data source used for each country in the analysis, along with the source type and survey period.

Table 5: Country-Level Occupational Licensing Data Sources

Country Group	Primary Data Source	Source Type
United States	Kleiner and Krueger (2013); CPS Supplements	Existing National Survey
European Union Countries	Koumenta and Pagliero (2019)	Existing Harmonized Survey
Japan	Morikawa (2018)	Existing National Survey
Argentina, Mexico, Brazil, Chile, Colombia, Peru	Original Surveys Conducted by Authors	Original Survey
India, Philippines	Original Surveys Conducted by Authors	Original Survey
South Africa, Nigeria	Original Surveys Conducted by Authors	Original Survey
Australia, New Zealand, Israel	Original Surveys Conducted by Authors	Original Survey
All Remaining Countries	Original Surveys Conducted by Authors	Original Survey

Notes: This table reports the underlying source of occupational licensing data for each country included in the analysis. U.S. estimates are based on the Westat Professional Data Initiative survey analyzed by Kleiner and Krueger (2013) and related CPS licensing supplements. European estimates are drawn from Koumenta and Pagliero (2019). Japanese estimates are based on Morikawa (2018). All remaining country estimates are based on original nationally representative surveys conducted by the authors between 2024 and 2026 in collaboration with Qualtrics.