

WORKING P A P E R

What is the impact of labour market regulation on employment in LICs?

How does it vary by gender?

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1. Abstract

Background: Controversy over the design of labour market policy often centers on achieving the delicate balance between preventing worker exploitation by guaranteeing basic rights, and avoiding loss of productivity or employment through excessive regulation. Collectively, the empirical literature documenting the impact of labour market regulation on employment is extensive and long-standing. However, much of this evidence focuses on developed or middle-income countries, resulting in a comparative dearth of literature that analyzes the impact of such policies in low-income countries (LICs).

Methods: We systematically reviewed available research on the impact of labour market regulation on employment in LICs. We selected studies for inclusion based on the relevance of the study method and context, as well as study quality. Given the small number of studies identified from LICs, we also drew lessons from the experience of countries that were LICs until recently. We used a framework synthesis to evaluate the evidence. We also conducted a meta-regression analysis (MRA) of the few comparable minimum wage studies in the formal sector.

Results: We identified four studies from LICs, 11 studies from recent LICs, and two cross-country studies that met the inclusion criteria. The studies cover a variety of labour regulations, including minimum wages, employment protection, firing rigidities, unemployment insurance, unionization, dispute resolution, and aggregate measures of labour regulation. Most studies focus on employment outcomes in the formal sector, but several studies consider informal, self-employment, or overall employment outcomes. Four studies from recent LICs examine differences in employment outcomes by gender.

The four studies from current LICs examine the effects of minimum wages, the right to unionize, and the impacts of firing rigidities on employment. All of these studies find that labour regulations are associated with lower formal employment levels and formal employment shares. One of these studies also considers the impact of labour regulations on the informal sector, and finds that higher minimum wages are not associated with the share of informal employment, but are associated with an increase in the share of self-employment.

The evidence from recent LICs includes seven minimum wage studies, all of which document a negative relationship between minimum wages and employment within formal (or covered) firms. In addition, five studies document a positive relationship between minimum wages and informal employment. The other four studies examine the impacts of India's labour regulations on employment, and three out of the four document a negative relationship between regulations that favour workers over employers and formal sector employment.

Finally, the two cross-country studies that consider at least one LIC and meet the inclusion criteria produce mixed results. It is important to keep in mind that these results are empirically dominated by non-LIC countries.

Our MRA lends some quantitative support to these results for LIC and recent LICs (though the analysis is limited by the low number of studies that show comparable estimates). In

the formal sector, we confirm a negative relationship between minimum wages and employment, after controlling for potential publication bias, although the statistical significance of the relationship varies across specifications (and the precision might be overestimated due to the low number of studies). When we restrict our analysis to studies that include elasticity estimates, we find an elasticity of about -0.08 in the formal sector. In other words, a 10% increase in the minimum wage would reduce formal employment by approximately 0.8%. The results of the MRA should be cautiously interpreted, given the small number of studies.

Only four studies examine how the impact of regulations differs by gender, and the results are mixed. However, the MRA does suggest that minimum wages may have a larger negative impact on the formal employment of women.

Conclusions: Despite the small number of high-quality empirical studies that met the inclusion criteria, we can conclude that the evidence for LICs (and recent LICs) points to there being a negative effect of regulations on formal employment, and a compensating positive effect on informal employment. The effect on overall employment rates, and on unemployment, is ambiguous. The effect of labour regulations by gender is also ambiguous.

2. Executive Summary

There is an extensive empirical literature examining the impacts of various labour market regulations on employment outcomes. However, much of this evidence focuses on developed or middle-income countries, resulting in a comparative dearth of literature that analyzes the impact of such policies in low-income countries (LICs). In addition, there are few studies that examine the impacts of such regulations by gender.

In this systematic review, we aim to synthesize the literature on the following questions:

- What is the impact of labour market regulation on employment in LICs?
- How does this vary by gender?

The review incorporates rigorous criteria for the inclusion of papers. Our search strategy resulted in two sets of searches. First, we searched specifically for studies on current LICs. The final coding of the relevant results yielded only four that met the inclusion criteria. Two out of the four studies are based on the same set of data and yield the same results, thus leaving only three truly distinct sets of results. Given the paucity of evidence from LICs, we expanded our search to include countries that were LICs until recently. We focused on studies that included at least one year of data in which the country was classified as an LIC during 1987 through 2010. Although these countries are no longer LICs, their experience from a period when they were LICs can be informative. This expansion allowed us to identify an additional 11 studies from recent LICs. Finally, two cross-country studies that included at least one LIC met our inclusion criteria. The included studies examine the impacts of a number of labour market regulations, including minimum wages, employment protection, firing rigidities, unemployment insurance, unionization, dispute resolution, and aggregate measures of labour regulation, on various employment outcomes.

The four studies from current LICs examine the effects of minimum wages in **Kenya**, the impacts of minimum wages and the right to unionize in **Bangladesh**, and the impacts of firing rigidities in **Zimbabwe** (and India, though India is not a current LIC). All of these studies find that labour regulations are associated with lower formal employment levels and formal employment shares. One of these studies also considers the impacts of labour regulations on the informal sector, and finds that higher minimum wages are not associated with the share of informal employment, but are associated with an increase in the share of self-employment. Taken together, their findings suggest that minimum wages may increase or decrease aggregate employment, particularly since self-employment accounts for a large share of the workforce in many developing countries.

Much of the evidence from recent LICs comes from only two countries: **Indonesia** and **India**. Four studies examine changes in minimum wages in Indonesia, while another four studies examine the impacts of India's labour regulations (including firing rigidities, severance pay, and laws about dispute resolution). The remaining three studies examine the impacts of minimum wages in **Ghana**, **Honduras**, and **Nicaragua**. All seven of the included minimum wage studies document a negative relationship between minimum wages and employment within formal (or covered) firms. In addition, five studies document a positive relationship between minimum wages and informal employment. Given that informal firms tend to pay lower wages and have lower productivity than even

small formal firms (La Porta and Shleifer 2009), a shift towards informal employment could protect a few formal workers at the expense of workers pushed into the informal sector. The decrease in formal employment and the concurrent increase in informal employment yield an ambiguous impact on overall employment. One of the studies from recent LICs finds a positive relationship between minimum wages and overall employment, while two others find no relationship. Four of the minimum wage studies also examine the impacts of labour regulation by gender, but the results are mixed. Three of the four studies on India document a negative relationship between regulations that favour workers over employers and formal sector employment.

We also identified two cross-country studies that consider at least one LIC and meet the inclusion criteria. However, it is important to keep in mind that these results are empirically dominated by non-LIC countries. One study finds that an increase in labour regulations is correlated with a reduction in the formal employment rate. In contrast, the other study examines overall unemployment rates; it does not find a significant relationship between labour regulations and overall unemployment, but does document a positive relationship between unemployment insurance and overall unemployment.

Given the small number of studies, our analysis was largely qualitative. However, we did identify six formal sector studies that had sufficiently comparable results to conduct a meta-regression analysis (MRA). Overall, our MRA results confirm that a higher minimum wage is associated with lower formal sector employment, particularly among certain groups of workers such as unskilled and female workers. We find little evidence of publication bias in the formal sector, and our results indicate that there is a true effect once we control for potential publication bias. When we restrict our MRA to studies that include elasticity estimates, we find an elasticity of about -0.08 in the formal sector. In other words, a 10% increase in the minimum wage would reduce formal employment by approximately 0.8%. The results of the MRA should be cautiously interpreted, given the small number of studies.

Despite the small number of studies from LICs and recent LICs, we can conclude that labour regulations in LICs decrease formal employment but increase informal employment, thus creating an ambiguous impact on overall employment. These results are consistent with basic economic theory, which suggests that an increase in the cost of formal labour will decrease equilibrium demand for that labour. However, workers displaced from the formal sector are likely to join the informal sector, thus pushing up equilibrium employment level in that sector. On the question of how the impact of labour regulations differs by gender, we are unable to draw any firm conclusions. Only four studies examine how the impact of regulations differs by gender, and the results are mixed.

The results of this systematic review are subject to three key limitations. First, conclusions based on such a small number of studies should naturally be cautiously interpreted. Second, the included individual country studies yield results from a total of eight countries out of a possible 75 (35 LICs and 40 recent LICs). Therefore, our conclusions may not be applicable to most LICs and recent LICs, since our evidence is drawn from a small fraction of these countries. Finally, while our goal was to be comprehensive and systematic in searching the literature, it is always possible that relevant articles were missed, particularly among unpublished studies or grey literature.

However, we believe that our search strategy, which included a number of databases of published literature, websites and databases of unpublished and grey literature, as well as snowballing and contacting experts, should mitigate this limitation.

3. Background

3.1 Aims and rationale for review

Controversy over the design of labour market policy often centers on achieving the delicate balance between preventing worker exploitation by guaranteeing basic rights, and avoiding loss of productivity or employment through excessive regulation. Collectively, the empirical literature documenting the impact of labour market regulations on employment is extensive and long-standing. However, much of this evidence focuses on developed or middle-income countries, resulting in a comparative dearth of literature that analyzes the impact of such policies in low-income countries (LICs). In addition, despite a large literature that seeks to understand the differences between the labour supply decisions of men and women, there is little evidence on whether the effects of labour regulations on employment outcomes differ by gender.

This systematic review aims to synthesize the literature on these two issues. The review incorporates rigorous criteria for the inclusion of papers, which are described in detail in Section 5. The aim is to systematically review available research on the impact of labour market regulation on employment in LICs, in order to develop findings that are robust and useful to policy-makers and others interested in this topic.

3.2 Definitional and conceptual issues

Governments intervene in labour markets to address inefficiencies that allow employers to extract rents from employees. Because labour reforms encompass a wide spectrum of policies, from governing the individual employee contract to collective action to social security, that affect a variety of outcomes, such as employment, workforce composition, and the tension between the informal and formal sectors, the research on this topic is diverse. While a common goal within the literature is to evaluate the effects of such reforms on employment outcomes, there is no unified theoretical or econometric approach for doing so.

For example, Djankov and Ramalho (2009) conduct an empirical exercise using three different sources that provide data on a wide spectrum of countries (including those in Sub-Saharan Africa, Eastern Europe and Central Asia, and the OECD), to demonstrate differences in the types and levels of labour regulations across nations. Labour regulations are measured using a single index that gauges the rigidities of hiring, firing, and hours, based on Botero et al. (2004) and the World Bank's *Doing Business* dataset. The results show the cross-country correlations between labour regulation, employment, and size of the informal sector. The authors note that these relationships cannot be interpreted as causal, and suggest that differing cultural values might affect levels of labour regulations. Since such values might also affect employment, identifying a causal relationship between labour regulations and employment is particularly challenging in the cross-country context. The authors conclude that labour laws are significantly more rigid in countries with incomes in the bottom quartile than in countries with incomes in the top quartile. In addition, more stringent labour regulation, as measured by a single index, is associated

with larger informal sectors and higher unemployment rates, especially for women and youth.

In contrast, Caballero et al. (2004) base their cross-country analysis within a traditional microeconomic flexibility framework. They develop a hazard adjustment model, exploiting the idea that more rigid labour regulation increases adjustment costs for firms, which affects the speed of employment adjustment to shocks. Their goal is to estimate the employment gap: the difference between the observed and frictionless (desired) levels of employment, where the desired level of employment is estimated by solving the usual firm optimization problem. They measure job security using a subset of the measures that were developed by Botero et al. (2004), as well as another index from Heckman and Pagés (2000). These measures are indices of dismissal protections and procedures, severance payments, and constitutional protection of employment. To measure effective job security, they interact labour regulations with a country's institutional context, which is captured by rule of law and government efficiency measures. Their main result indicates that effective job security has a significant negative effect on the speed of adjustment of employment to shocks.

A third example is work by Mondino and Montoya (2004), who evaluate the impact of labour regulations on firms' labour demand within an empirical framework, in an attempt to reconcile rigid labour laws, increasing mean real wages, and increasing output per worker in Argentina. The outcomes of interest are earnings and labour demand. To estimate the impact on earnings, they employ a Mincerian regression, and measure regulation using an indicator for whether a job is protected by any labour regulation. Drawing on micro-data from an employee survey, they find that men and women must sacrifice earnings in order to have access to a job that is protected by labour regulations. To estimate the impact of regulations on labour demand, they use a simultaneous equation framework. In this context, labour regulation is measured by non-wage labour costs to the firm, such as payroll tax pensions and family allowances. Using a firm panel dataset, they find that as the burden of regulation increases, there is a negative effect on total worker-hours as firms substitute away from labour. There is evidence that firms decrease employment at the extensive margin, and use remaining workers more intensively.

These three examples illustrate the diversity of models, regulations, and outcomes within the literature on labour regulation and employment. To appropriately and systematically review this highly diverse literature, our search strategy focused on a number of regulations that fall under the umbrella of "labour regulation": minimum wages, mandatory employment benefits, severance pay (separation compensation), unemployment insurance, employment taxes, hour restrictions, hiring rigidities, firing rigidities, and collective bargaining. We considered studies that look at the impact of these regulations on a variety of employment outcomes, including employment level, employment growth, and the unemployment rate. Whenever possible, we documented evidence from the included studies on how the impacts of labour regulations differ by gender, age, skill level, and other workforce characteristics. Moreover, we documented a number of results that distinguish between informal and formal employment, although these studies were largely drawn from recent LICs rather than current LICs.

3.3 Research background

Studies of the impact of labour market regulations on employment generally take one of two forms. In this section, we provide a brief, non-systematic review of this literature, focusing on developing countries in general.

First, there are many studies that explore the cross-country relationship between some measure of the rigidity of labour regulations and employment. These studies generally conclude that tougher labour regulations are associated with lower employment, as well as slower adjustment to shocks (e.g., Botero et al. 2004, Caballero et al. 2004, Djankov and Ramalho 2009, Heckman and Pagés 2000, Lustig and McLeod 1997).

A second strand of the literature uses the variation within a country to elicit the impact of labour regulations on employment. Fallon and Lucas (1991, 1993) analyze regulations in India and Zimbabwe that increased firing rigidities, and find that these regulations reduced employment significantly (by an average of 17.5% in 35 Indian industries, and by an average of 25.2% in 29 Zimbabwean industries). However, the Zimbabwean law was enacted at the time Zimbabwe gained independence, so isolating the effect of the change would have been a challenge. Jones (1997) finds that the minimum wage policies enacted in Ghana in the 1970s and 1980s reduced the number of formal jobs (and increased the number of informal jobs).

In India, a seminal study by Besley and Burgess (2004) uses the variation in regulations governing firing rigidities and dispute resolution mechanisms across Indian states and over time to document that states with stricter regulations have lower formal sector employment. Although their measure of labour regulations has been criticized (Bhattacharjea 2006), further work has generally concluded that India's labour regulations decrease employment (Ahsan and Pagés 2009, Amin 2009). In Latin America, evidence suggests that stricter labour regulations are associated with lower formal sector employment (Kaplan 2009, Kugler 1999, Kugler 2004, Mondino and Montoya 2004, Saavedra and Torero 2004).

A number of studies have focused specifically on minimum wages. Bell (1997) finds that manufacturing employment is reduced when minimum wages increase in Colombia. Maloney and Nuñez (2001) corroborate this result for the whole Colombian economy using panel employment data: they show that increases in the minimum wage are associated with increases in the probability that a formal sector employee becomes unemployed. Rama (2001) studies an extreme increase (doubling in real terms) of the minimum wage that occurred in Indonesia in the early 1990s and concludes that it resulted in a modest reduction in employment. Santiago (1989) examines the sustained minimum wage hikes in Puerto Rico during the 1970s, and concludes that they contributed to structural changes in the labour market, including a lower employment-to-population ratio, a lower labour force participation rate, and a higher unemployment rate.

It is important to note that most of these studies document the relationship between labour regulations and employment in the formal sector, where these regulations are relevant. However, there are large informal sectors in the labour markets of most developing countries, in which labour regulations do not bind. In his study of minimum wage in Puerto Rico, Santiago (1989) speculates that workers displaced from the covered (formal) sector may attempt to find work in the uncovered (informal) sector for a period

of time. Using data from Brazil from 1982 to 2000, Carneiro (2004) concludes that minimum wages moves workers from formal to informal employment; however, Lemos (2004) studies the same time period in Brazil and concludes that higher minimum wages are associated with lower formal and informal employment. Among studies that focus on unemployment (or overall employment), some might find no overall effect because of a compensating increase in employment in the informal sector. In accordance with this, the cross-country evidence indicates that the size of the informal economy is larger in countries with stricter labour regulations (Botero et al. 2004).

While much of the evidence suggests that stricter labour regulations are associated with lower formal employment, there are some results that challenge this view. de Barros and Corseuil (2004) find that increased separation costs in Brazil do not significantly affect the demand for labour. Downes et al. (2004) finds that severance payments in Jamaica, Barbados, and Trinidad and Tobago are not associated with significant employment impacts. Moreover, the effects of labour regulations are heterogeneous across different types of workers: for example, two papers by Montenegro and Pagés document that job security increases the age profile of employment, yielding higher employment rates for older and skilled workers, but lower employment rates for younger and unskilled workers (Montenegro and Pagés 2004, Pagés and Montenegro 2007). Similarly, although Bell (1997) documents that minimum wages decrease employment in Colombia, she does not find any effect when looking at Mexican manufacturing. She notes, however, that one would not expect a significant effect of modest increases in the minimum wage if it were not initially binding, as was the case in Mexico.

There is a smaller evidence base on how the effects of labour market regulations vary by gender, and the evidence is somewhat mixed. Montenegro and Pagés (2004) find that stricter job security provisions tend to decrease the probability that women are employed, relative to men, but that higher minimum wages are associated with higher levels of female employment. Mondino and Montoya (2004) find that tougher labour regulations result in larger declines in male earnings than female earnings. In the cross-country context, Botero et al. (2004) find that stricter employment and collective bargaining laws are associated with larger increases in female unemployment than male unemployment, while Feldmann (2009) finds that more decentralized collective bargaining processes are associated with lower female unemployment. Meanwhile, Heckman and Pagés (2000) find insignificant effects of job security regulations on female employment in Latin America.

There are a number of reviews that examine the impacts of labour regulations on employment in a variety of developing countries. For example, Boeri et al. (2008) conduct a non-systematic review of the effects of minimum wages, mandated benefits, dismissal costs, and unemployment insurance on employment and other outcomes in developing countries. They find that the evidence is generally inconclusive, although they do note that minimum wages appear to be associated with poorer employment prospects for women, youth, and unskilled workers. They also conclude that dismissal costs are associated with increased informality and reduced job turnover and job reallocation. Djankov and Ramalho (2009) also conduct a review of employment regulation in developing countries, focusing on studies published since 2004. They conclude that countries with stricter labour regulations tend to have higher unemployment rates and larger informal sectors. To our knowledge, however, there are no systematic reviews of the impacts of labour market regulations on employment outcomes in LICs.

4. Objectives

We reviewed empirical research on the following questions:

- *What is the impact of labour market regulation on employment in low-income countries (LICs)?*
- *How does this vary by gender?*

As described in more detail in Section 5 of this report, the review examined the impacts of a number of labour market regulations, including minimum wages, firing rigidities, and various aggregate measures, on various employment outcomes. We focused on evidence from LICs, as defined by the World Bank.¹ The list of LICs is provided in Appendix A. However, since we found very few studies from LICs that met the inclusion criteria, we expanded our search to consider evidence from countries that were, until recently, LICs. For these countries, we only included studies that covered a period of time when the countries were classified by the World Bank as LICs. Finally, we drew lessons from cross-country studies that included at least one LIC.

5. Methods

5.1 User involvement

We communicated with the Department for International Development (DFID) and MAER-Net in order to refine the research question and focus our search strategy. In addition, once we had developed a list of included studies, we communicated with academic experts working in the field of labour regulations in developing countries to ascertain their opinions on whether we could include additional studies.

RAND researchers have established networks with donors and policy-makers in donor and developing countries (including USAID, World Bank, the European Commission, and governments of Mexico, Honduras, Belize, Ecuador, Uganda, Kenya, Indonesia, India and others). RAND will work with partners in this network, as well as DFID, to disseminate the systematic review findings.

To further disseminate our results and engage with policymakers and academics, the full systematic review will be published as a RAND working paper and will be freely available to all audiences through RAND's website. The working paper will be circulated through RAND's extensive professional outreach network.

5.2 Identifying and describing studies

5.2.1 Defining relevant studies: inclusion and exclusion criteria

1. Study topic: The impact of labour regulations on employment.

¹ <http://data.worldbank.org/about/country-classifications/country-and-lending-groups>

All studies included consider the effect of at least one type of labour regulation on an employment outcome. Our search strategy (described below) looked for the effects of the following labour regulations:

- Minimum Wages
- Mandatory employee benefits
- Severance pay (separation compensation)
- Unemployment insurance
- Employment taxes
- Hour restrictions
- Hiring rigidities
- Firing rigidities
- Collective bargaining

We only considered studies that look at effects on employment outcomes (namely: employment, unemployment, hours worked, etc.) rather than, for example, consumption or poverty outcomes.

2. Location: We began by selecting studies that included at least one LIC. However, we found only four studies that met the other inclusion criteria and were conducted in LICs. Therefore, we expanded our searches to consider countries that were recently LICs.

Ultimately, we included three types of studies:

- Studies using data from individual LICs: We used the World Bank's definition of LICs (see Appendix A).
- Studies using data from individual, recent LICs: We used the World Bank's list of historical LIC classifications, dating back to 1987 (see Appendix A). For recent LICs, we only included studies that covered some period of time during which these countries were classified as LICs.
- Cross-Country studies that include at least one LIC: Since the results from these studies apply not only to LICs but to a wider group of countries, we reviewed and analyzed these studies separately from the individual country studies.

3. Study design: (Identification strategy)

We included all studies that attempted to establish a causal effect using one of the following methods:

- **Experimental:** We searched for studies that use experimental methods to elicit the causal effects of labour regulation on employment outcomes. However, we did not find any relevant studies that used such experimental methods.
- **Quasi-Experimental:** We searched for studies that exploit “natural experiments.” The one included study that uses quasi-experimental methods exploited differential changes in minimum wages in two neighboring urban areas.
- **Regression-Based:** We included studies that take advantage of within-country variation in labour regulations to study their effects on employment in a quantitative manner.
- **Cross-Country, Panel-Data Analysis:** For cross-country studies, we included only those that rely on variation both across countries and over time, in order to avoid spurious correlation between labour regulations and other, country-specific, characteristics.

4. Language of publication: English.

5. Date of publication: After January 1, 1990.

5.2.2 Identification of potential studies: Search strategy

We conducted two types of traditional searches: complex and non-complex. We followed the procedure outlined in the protocol for complex searches in seven databases. We required a modified complex search approach for the eighth database, JSTOR.

We conducted non-complex searches in four databases. Two databases, Africabib and BLDS, required a modified search approach.

We then conducted two types of grey literature searches. We first searched for unpublished and working papers in two additional databases, IDEAS and JOLIS. Then we searched a number of websites.

Appendix B presents the details of our search strategy for each source, and search results are summarized in Section 6.

Snowballing

We started a “snowballing” process using one of the included papers that examined the impacts of labour regulation in an LIC (Andalon and Pagés 2009). This consisted of selecting relevant articles from the reference list of this study and looking at the reference lists of those articles for additional titles that might be relevant.

Contacting Experts

We emailed our list of included articles to three experts in the field of labour regulations, who were also authors of LIC studies selected for coding, and asked whether they knew of

additional studies that might be included.² All three experts indicated that we had uncovered the key literature on labour regulations and employment in LICs. Two of them noted that very little empirical work had been done on this issue in LICs, which may be due to the fact that LICs have trouble implementing or enforcing labour regulations.

5.2.3 Screening studies: applying inclusion and exclusion criteria

We applied our inclusion criteria to the results from the searches as follows.

1. Title screening: If from the title alone we could ascertain that the study did not analyze the impact of labor regulations on employment or did not focus on developing/low-income countries, we excluded the study.
2. Title and abstract screening: If the title was uninformative or there was ambiguity about study relevance, then the inclusion criteria were applied to the abstract. If the abstract indicated that the study did not analyze the impact of labor regulations on employment or did not focus on developing/low-income countries, we excluded the study.
3. Title, abstract, and full-text screening: For some studies, there was ambiguity about relevance of the study even after the abstract screening. These were usually cross-country analyses, where the included countries were not listed. In such cases, we tried to find the full-text of the article to determine eligibility.

Each study was screened by one researcher. However, as described in Section 5.2.5, we conducted a pilot study of the screening procedure to confirm that the screening criteria were applied consistently.

5.2.4 Characterising included studies

Two researchers independently reviewed each study selected for coding using the coding tool, which is provided in Appendix C. We then compared the results and arrived at a consensus about each study.

Extracted data included the following:

- Full bibliographical reference
- Publication type (e.g., peer review journal article, institution working paper)
- Study type (individual country/countries or cross-country study)
- Country or countries studied
- Data (e.g., primary/secondary, unit of observation)
- Study design and data analysis methods

² We contacted Louise Fox, Robert E.B. Lucas, and Carmen Pagés, and we thank them for their valuable input.

- Type of labour market regulation examined (minimum wage, collective bargaining law, etc.)
- Employment outcomes
- Variation in employment outcomes by gender (if applicable).

The section of the coding tool that addresses study design draws heavily on the code book for methodological rigor developed in the “Maryland report” (Sherman et al. 1996).

5.2.5 Identifying and describing studies: quality assurance process

Pilot testing of search and screening strategies and the coding tool

We began by using a set of potential articles for inclusion (see Appendix D) to develop a draft complex search strategy. We piloted the strategy by conducting a search in EconLit, and we modified the search parameters for the complex databases slightly based on the results. In addition, as noted in Section 5.2.1 and discussed in detail in Appendix B, when complex search terms could not be used in a search engine, or when the initial search strategy created an unmanageable list of results, we modified the strategy as needed.

To test our inclusion criteria and ensure consistency within the team, we conducted a pilot screening on 50 studies. These 50 studies were screened by each member of the team, and the results discussed. Any cases of disagreement were discussed thoroughly so that at the end of the process each team member was qualified to screen the results individually.

Once the team had agreed upon pilot studies to be coded, two researchers independently applied the coding tool to the selected studies. The researchers compared their coding and reached a consensus.

External Quality Assurance

For this review we are taking part in a peer review organized by DFID. This includes review of the protocol and draft report by DFID staff as well as by an external review team organized through MAER-Net. The draft protocol was reviewed by DFID and MAER-Net, and we modified the protocol in accordance with comments received.

5.3 Methods for synthesis

5.3.1 Assessing quality of studies

We made a judgment about the quality of the study based on the “weight of evidence” framework of Gough (2007). The framework judges the study in three areas:

- Weight of Evidence A: Is the study well-executed? We considered factors such as whether the identification strategy’s assumptions are likely to be met; whether there is an assessment of the quality of the data; whether there is a discussion of

the possible biases and their directions; and whether sensitivity analyses are performed.

- Weight of Evidence B: Is the method used in the study relevant for the review question?
- Weight of Evidence C: Is the topic focus or context of the study relevant to the review question?

The studies were evaluated with respect to each of these areas using data extracted with the coding tool (Appendix C), particularly the elements that relate to study design.

We aimed to focus on studies that fulfilled all three criteria. However, as discussed above, we found only four studies that examined the impacts of labour regulations on employment outcomes in LICs, so we expanded our search to include recent LICs.

5.3.2 Overall approach to, and process of, synthesis

Our synthesis drew on the included studies to review the evidence on the impact of labour regulations on employment outcomes in LICs, and to distinguish between impacts on men and women.

We have summarized our findings using a framework synthesis. We sorted studies by (1) individual country versus cross-country studies, (2) the type of labour regulations evaluated, and (3) the type of employment outcomes considered. Section 7 presents the results of this exercise. For the individual studies, we began by focusing on the LIC studies, and then expanded our synthesis to draw lessons learned from recent LICs.

In the protocol, we discussed the possibility of applying meta-regression-analysis methods to the included studies. However, we found only four individual country studies from LICs and 11 additional individual country studies from recent LICs. Moreover, the employment measures varied between studies. We had anticipated that the most likely labour regulation that would allow a meta-analysis would be minimum wage. Since we only found two minimum wage studies in LICs, and seven minimum wage studies in recent LICs, we did not conduct a meta-regression analysis.

5.4 Meta-Regression Analysis

As we discuss in detail in the following sections, the studies we identified vary greatly in terms of the specific labour regulations and employment outcomes considered. However, we did identify nine studies that examined the impacts of minimum wages on employment. Using these studies, we were able to identify six studies that look at the impact of employment in the formal sector that provided estimates that were sufficiently comparable to be used in a meta-regression analysis (MRA). We provide details of how the MRA was conducted, along with results, in Section 8.4.

5.5 Deriving conclusions and implications

We derived implications and conclusions from the synthesis of findings based on review team discussions. We have drawn in particular on the expertise of Dr. Krishna Kumar, a

Senior Economist at RAND and review team member, who has extensive experience in international development and employment issues.

6. Search Results

Our final strategy resulted in two sets of searches. In Set 1, we searched specifically for current LICs, as originally proposed. The final coding of the relevant results yielded too few studies; of the 19 individual country studies selected for coding, only 4 met the inclusion criteria. After discussion with the DFID and MAER-Net teams, we expanded our country list to those nations that were recent LICs (see Appendix A), thus conducting search Set 2. From Set 2 an additional 19 studies were selected for coding, and 11 met the inclusion criteria.

Within each search set, we conducted two types of traditional searches: complex and non-complex. The complex searches yielded a total of 2,530 results; the results of our non-complex search strategy yielded 75 titles from Set 1 and Set 2.

We then conducted two types of grey literature searches. We first searched for unpublished and working papers, in two additional databases, which yielded 258 results in total. Then we searched a number of websites, resulting in an additional 1,195 titles from both search sets. Our snowballing process yielded half a dozen more results.

In total, the results of the searches for current and recent LICs yielded 4,064 results. We then screened the studies as described in Section 5.2.3, and selected 19 current LIC studies, 19 recent LIC studies, and 10 cross-country studies for coding. Table 6.1 provides a summary of all results from each type of search.

Table 6.1: Search Results and Studies Selected for Coding

Search Type	Search Results	Selected for Coding		
		Set 1: Current LICs	Set 2: Recent LICs	Cross-country
Complex	2,530	18	14	6
Non-complex	75	0	0	0
Unpublished	258	0	2	0
Website	1,195	0	1	4
Snowballing	6	1	2	0
Total	4,064	19	19	10

7. Details of Included Studies

Summary of Included Studies

We applied the coding tool (Appendix C) to the studies selected for coding, following the procedures described in Section 5. For each included study, Appendix E contains a summary of our key conclusions from the quality appraisal, based on Section C of the coding tool. This exercise resulted in the inclusion of 4 studies from LICs, 11 studies from recent LICs, and 2 cross-country studies. Table 7.1 provides a summary of the included studies.

Table 7.1: Included Studies

	Set 1: Current LICs	Set 2: Recent LICs	Cross-country
Selected for Coding	19	19	10
Included	4	11	2

Included studies vary considerably in terms of the type of regulation studied. Table 7.2 summarizes the number of studies for the different types of regulations. Note that column totals will not match the total number of studies identified in Table 7.1 as some studies analyze the impact of more than one type of regulation.

There are nine studies that analyze the impact of minimum wages on employment outcomes; one that considers employment protection legislation (EPL); one that uses a measure of unemployment insurance; three that include firing rigidities; one that studies unionization; two that analyze dispute resolution; and five that use aggregate measures of labour regulation.

Table 7.2: Summary of Included Studies by Type of Regulation.

	Current LICs	Recent LICs	Cross-country
Minimum wages	2	7	
Employment protection legislation		1	
Unemployment insurance			1
Firing rigidities	2	1	
Unionization	1		
Dispute resolution		2	
Aggregate measures of labour regulation		3	2

Note: Numbers do not add up to total number of studies as some studies consider multiple regulations.

Table 7.3 shows the number of studies by different types of outcomes. There is less heterogeneity in the broad category of outcomes (e.g., informal employment) than in the type of intervention studied. However, within each broad outcome category, the studies measure the outcome in a variety of ways (e.g., informal employment level, informal employment share in total employment, informal to formal employment ratio). In this table, we have grouped the outcomes into four broad categories for ease of interpretation. Note that column totals will not match the total number of studies identified in Table 7.1 as some studies analyze impacts on more than one outcome.

Most studies (16) analyze the impact of labour regulations on formal employment outcomes; five evaluate informal employment outcomes; two study self-employment outcomes; and four look at overall employment or unemployment.

Table 7.3 Summary of Included Studies by Outcome

	Current LICs	Recent LICs	Cross-country
Formal employment	4	11	1
Informal employment	1	5	
Self-employment	1	1	
Overall employment or unemployment		3	1

Note: Numbers do not add up to total number of studies as some studies consider multiple outcomes.

Categorizing the included studies according to method of analysis, we did not find any LIC articles that use quasi-experimental methods, although one recent LIC study does use such methods. The rest of the LIC and recent LIC studies use regression-based methods, with panel regressions employed most often among recent LIC papers. Table 7.4 summarizes included studies by method of analysis.

Table 7.4. Summary of Included Studies by Method

	Current LICs	Recent LICs	Cross-country
Quasi-Experimental		1	
Regression-Based: Panel		9	2
Regression-Based: Time-Series	2	1	
Regression-Based: Cross-Section	2	1	

Note: Numbers do not add up to total number of studies as some studies used multiple methods.

Overall, we identified only four studies that use data from LICs and employ rigorous analytical methods. Among recent LICs, we identified eleven additional studies that can shed light on the possible impacts of labour regulations on LICs. We complement the analysis with evidence from two cross-country studies that include at least one LIC.

8. Synthesis Results

8.1 The Evidence for Low-Income Countries

Available Evidence

Our search revealed only four individual country studies of LICs that met the inclusion criteria. Table 8.1 summarizes each study, including the country, time period, labour regulation analyzed, employment-related outcomes, method used to identify the impact of labour regulation on employment outcomes, and key findings. Two out of the four studies are based on the same set of data and yield the same results, thus leaving only three truly distinct sets of results.

Andalon and Pagés (2009) examine the impact of minimum wages on the shares of formal, informal, and self-employment in Kenya. Anderson et al. (1991) also examine the impact of minimum wages, as well as the right to unionize, on the employment level in formal industries in Bangladesh. The next two studies (Lucas and Fallon 1991, 1993), which essentially provide duplicate information, examine the impact of firing rigidities in Zimbabwe and India on formal employment levels and hours worked.

All studies document that labour regulations are associated with lower formal employment levels and formal employment shares. Anderson et al. (1991) find that minimum wages reduce labor demand and formal employment, although they do not find that the right to unionize affects employment. Lucas and Fallon (1991, 1993) study the impact of redundancy regulation, under which firms are required to obtain government permission before firing employees. They find that this regulation reduced total employment in 80% of the industries affected. However, they do not find any relationship between firing rigidities and hours worked in India, suggesting that employers adjust along the extensive margin (number of workers) rather than the intensive margin (hours per worker).

Only one study (Andalon and Pagés 2009) considers the impacts of labour regulations on the informal sector. They find that higher minimum wages are not associated with the share of informal employment, but are associated with an increase in the share of self-employment. Taken together, their findings suggest that minimum wages may increase or decrease aggregate employment, particularly since self-employment tends to account for a large share of the workforce in developing countries (La Porta and Shleifer 2009).

Table 8.1 Description of studies on LICs

Study/Setting	Method	Findings
<p>Andalon and Pagés (2009) Country: Kenya Time period: 1998-1999 Regulation: Minimum wage (Kaitz ratio, ratio of minimum to median wage) Outcomes: Shares of salaried formal, informal, and self-employment in total employment</p>	<p>Regression based, cross-sectional. Identification based on variation in minimum wage by occupation and location. Results are potentially confounded if factors that explain different employment levels are correlated with variation in the minimum wage across occupation and location.</p>	<p>Formal employment: Higher Kaitz ratio associated with lower share of salaried formal employment. Informal employment: Higher Kaitz ratio associated with higher share of self-employment, not significantly associated with share of informal employment. Some variation in significance of results depending on specification.</p>
<p>Anderson et al. (1991) Country: Bangladesh Time period: 1988-1989 Regulation: Minimum wage and right to unionize Outcomes: Formal employment level</p>	<p>Regression based, cross-sectional. Identification based on different applicability of regulation in different sectors. Results are potentially confounded if factors that explain different employment levels are correlated with the applicability of regulation.</p>	<p>Minimum wage reduces formal employment. Union effects on employment are small/insignificant. Unionization associated with reduction of skilled labor, but little/no impact on overall firm employment.</p>
<p>Lucas and Fallon (1991), Lucas and Fallon (1993) Country: India and Zimbabwe Time period: 1959-1981 (India), 1960-1984 (Zimbabwe) Regulation: Firing rigidities. Laws that require firms to ask the government for permission to lay off employees. In India, the law also requires permission for closure, but applies only to large firms. Outcomes: India: Formal employment level, hours Zimbabwe: Employment level (likely formal; excludes small firms)</p>	<p>Regression based, time series. Identification based on pre-post analysis of regulations in a number of industries. Authors highlight potentially major challenge to identification in Zimbabwe, where independence brought about many changes at the same time.</p>	<p>Regulations reduce in employment in over 80% of industries. In India, no consistent employment effects among smaller formal firms that were not covered by regulation. In India, no significant change in hours worked.</p>

We cannot derive solid conclusions from the above review, because of the paucity of studies (three, in essence) and the methodological limitations encountered. The methods of Anderson et al. (1991) and Andalon and Pagés (2009) are similar and consist of exploiting cross-sectional variation in the applicability of regulation across economic sectors. In the case of Andalon and Pagés (2009), the method consists of regressing formal, informal, and self-employment shares on Kaitz ratios (of minimum to median wages) in a cross section, where the variation in the Kaitz ratio comes from occupations and locations within Kenya. In the Anderson et al. (1991) study of Bangladesh, the regression is of employment against minimum wages and the right to unionize, which was applicable only in some industries. The problem with these methods is that factors taken into consideration by policy-makers when regulating a sector can themselves be correlated with the level of employment. For example, it is possible that regulators are more likely to impose minimum wages where there are strong unions. If high rates of unionization are correlated with a low level of formal employment and a high level of informal employment, then the analysis would find a spurious relationship between minimum wage regulation and informal/formal employment levels. In contrast, the two Lucas and Fallon studies employ time-series analysis. The problem with this method (as the authors themselves admit) is that other factors could be changing at the time of the policy change, potentially confounding the results. This concern is particularly severe in the case of the LIC included in their study (Zimbabwe), since the change in labour regulation occurred at the time of independence. There are no LIC studies using panel methods, which could help to control for such sector- or time-specific effects.

8.2 The Evidence for Recent Low-Income Countries

Given the paucity of evidence from LICs, we expanded our search to include countries that were LICs until recently. We focused on studies that included at least one year of data in which the country was classified as an LIC (from 1987 to 2010). Although these countries are no longer LICs, their experience from a period when they were LICs can be informative.

Table 8.2 summarizes the results of eleven studies. Much of the evidence from recent LICs comes from two countries: Indonesia and India. Four studies examine the impacts of India's labour regulations (including firing rigidities, severance pay, and laws about dispute resolution), while another four studies examine changes in minimum wages in Indonesia. The remaining three studies examine the impacts of minimum wages in Ghana, Honduras, and Nicaragua.

All of the minimum wage studies (Alaniz et al. 2011, Alatas and Cameron 2008, Bird and Manning 2003, Comola and de Mello 2011, Gindling and Terrell 2009, Jones 1997, Suryahadi et al. 2003) document a negative relationship between minimum wages and employment within formal (or covered) firms. In addition, five studies (Alaniz, Gindling and Terrell 2011, Bird and Manning 2003, Comola and de Mello 2011, Gindling and Terrell 2009, Jones 1997) document a positive relationship between minimum wages and informal (or uncovered) employment. Thus the negative effect on formal employment levels is mitigated, and the effects on overall employment are mixed. Comola and de Mello (2011)

show that in Indonesia, higher minimum wages lead to a reduction in formal employment, an increase in informal employment, and an increase in overall employment. In Honduras, Gindling and Terrell (2009) find that minimum wages reduce employment in large firms (which comply with the minimum wage), causing a shift in employment towards small firms (where there is little compliance), and that the overall effect on unemployment is close to zero. In Nicaragua, Alaniz et al. (2011) find no relationship between minimum wages and unemployment, but do find that higher minimum wages are linked to exits from the labour force. This set of results is consistent with basic economic theory, which we present in detail in Section 9.

Three studies that examine the increase in minimum wages in Indonesia find that the effects differ across groups of workers. Suryahadi et al. (2003) find that the increase in minimum wages reduces formal employment for all urban workers except white collar workers, for whom there is an increase in employment. Bird and Manning (2003) find that the increase in minimum wages has stronger effects on youth than on adults. Gindling and Terrell (2009) document that minimum wages have the largest effects among the least educated workers. Moreover, there is some evidence that higher minimum wages are correlated with higher unemployment among workers with a secondary education or above, but not among workers with less than a secondary education. This result is somewhat surprising, since the minimum wage would be more likely to bind for lower skilled workers. The authors suggest that workers with a secondary education are more likely to be able to afford being openly unemployed.

Similarly, Alatas and Cameron (2008) find that the effects of minimum wages in Indonesia differ across different types of firms. In their baseline specifications, they find that minimum wages are related to decreases in formal employment levels and growth among small domestic firms, but not among large domestic or foreign firms. In fact, there is some evidence of a positive relationship between minimum wages and employment levels and growth in large domestic and foreign firms, but those results are not statistically significant in most cases. It should be noted that their results for small as well as large firms are not always consistent when they perform sensitivity tests.

Four of the studies listed in Table 8.2 present mixed results on the effects of labour regulations on female employment versus male employment. Suryahadi et al. (2003) find a stronger reduction in formal employment among female workers than among male workers, while Comola and de Mello (2011) find the opposite. Although the magnitudes of the effects are larger for males than females in Comola de Mello (2011), the coefficient on the unemployment rate is only statistically significant for females, while the coefficient on total employment is only statistically significant for males. Bird and Manning (2003) find that minimum wages decrease female employment in both the formal and informal sectors in a similar manner, thus leaving the ratio of informal to formal female employment unchanged (in contrast to male employment, for which the ratio of informal to formal sector employment increases). Jones (1997) does not find any relationship between minimum wages and female employment rates.

The remaining four studies (Ahsan and Pagés 2009, Amin 2009, Besley and Burgess 2004, and Fagernas 2007) examine the impacts of labour regulations in India, and all four focus on amendments to the Industrial Disputes Act (IDA) of 1947. These four studies exploit

state-level variations to the IDA; the Lucas and Fallon (1991, 1993) studies discussed above examined the impacts of a national amendment to the IDA.

The four studies use variations of a labour regulation index originally developed by Besley and Burgess (2004). These authors code state-level amendments to the IDA as being either “pro-worker” or “pro-employer,” and exploit the variation in states’ “pro-worker” or “pro-employer” rankings over time. Ahsan and Pagés (2009) build on their index by separately examining amendments that affect employment protection legislation (EPL), including; rules on settling industrial disputes; and restrictions on the firing of workers or closure by large firms. Amin (2009) exploits cross-sectional variation in the Besley and Burgess (2004) measure, combined with retail store owners’ perceptions about enforcement. Fagernas (2007) modifies the Besley-Burgess approach by including indicators of judicial process, as increased judicial efficiency is correlated with higher degrees of formalization. It is important to note that the Besley and Burgess (2004) measure has been criticized by Bhattacharjea (2006), who argues that Besley and Burgess (2004) mistakenly coded several amendments; that their procedure collapses multiple amendments in any given year into one number; and that they ignore labour laws other than the IDA. Ahsan and Pagés (2009) re-classify the specific amendments critiqued by Bhattacharjea (2006) and find that their main results do not change.

Three of the four studies document a negative relationship between “pro-worker” regulations and formal sector employment (in the manufacturing sector for Besley and Burgess 2004 and Ahsan and Pagés 2009; in the retail sector for Amin 2009). In contrast, Fagernas (2007) does not find any consistent relationship between “pro-worker” amendments and the shares of employment in industry, services, agriculture, casual work, or self-employment. Her results do show some weak correlations, but they are very sensitive to model specification.

Ahsan and Pagés (2009) differentiate between three different aspects of labour regulations. They show that pro-worker EPL and dispute resolution amendments reduce production workers³ and total employment (production and non-production workers), but that amendments on firing/closure for large firms only reduce employment in states where dispute resolution is also relatively difficult. They also show that most employment effects are due to firm closures, rather than a reduction in employees per firm.

Finally, Fagernas (2007) does not find a robust relationship between labour regulations and self-employment. However, Besley and Burgess (2004) document that pro-worker labour regulations increase informal output. Similarly, Amin (2009) extends his basic results by showing that the employment effects are significant for permanent, but not temporary workers, and that firms in states with more pro-worker regulations and higher perceived enforcement report facing stronger competition from informal retailers.

³ Workers involved in the manufacturing process.

Table 8.2 Description of studies on recent LICs

Study/Setting	Method	Findings
<i>Studies Considering Minimum Wages</i>		
<p>Alatas and Cameron (2008) Country: Indonesia Time period: 1990-1996 Regulation: Minimum wages Outcomes: Formal employment level, formal employment growth</p>	<p>Quasi-experimental. Exploits the proximity between Jakarta and Botabek, a neighboring urban area in West Java. From 1990 to 1993, a lower minimum wage prevailed in Botabek, although it had similar manufacturing and land rental costs per worker as Jakarta. Between 1990 and 1996, minimum wages in both Jakarta and Botabek increased, with Botabek increasing its minimum wage faster, so that by 1994, the minimum wages in the two urban areas were the same. Uses difference-in-differences (DID) estimates.</p>	<p>Larger increase in minimum wages in Botabek reduces employment level and employment growth (proportional change in employment level) relative to Jakarta, but only for small domestic firms. Some specifications indicate positive relationship between minimum wage and employment among large domestic and foreign firms. However, results not always consistent in two robustness tests. Net plant openings not related to minimum wage, except for large foreign firms, which show some evidence of a positive relationship between minimum wages and net openings.</p>
<p>Bird and Manning (2003) Country: Indonesia Time period: 1990-2000 Regulation: Minimum wages Outcomes: Ratio of informal employment to formal urban employment, formal sector employment level, female formal employment level, female informal employment level</p>	<p>Regression-based, panel. Identification based on changes in minimum wages using a province-level panel, controlling for province dummies. However, only the specification looking at effect of minimum wages on female employment in formal and informal sectors separately uses time dummies; other specifications use a post-crisis dummy.</p>	<p>Formal employment: Minimum wages reduce formal employment but only after the 1997 crisis (after which labor was allowed to organize). Informal employment: Minimum wages increase ratio of informal to formal employment but only after the 1997 crisis. Effects by gender: Minimum wages reduce formal and informal female employment approximately equally, yielding no change in the informal to formal employment ratio.</p>
Comola and de Mello (2011)	Regression-based, panel. Identification based on	Formal employment: Minimum wages reduce

<p>Country: Indonesia Time period: 1988-1999 Regulation: Ratio of minimum to mean wages Outcomes: Share of formal workers, share of informal workers, unemployment rate, overall employment</p>	<p>variation in ratio of minimum-to-mean-wages, and a set of controls.</p>	<p>formal share. Informal employment: Minimum wages increase informal share. Overall employment: Minimum wages decrease unemployment rate. Effects by gender: Impacts larger in magnitude for men than women. Overall unemployment rate effect only statistically significant for women. Overall employment effect only statistically significant for men.</p>
<p>Suryahadi et al. (2003) Country: Indonesia Time period: 1988-2000 Regulation: Minimum wages Outcomes: Formal employment (urban sector)</p>	<p>Regression-based, panel. Identification based on variation in minimum wages within provinces over time.</p>	<p>Minimum wages reduce urban formal sector employment. Effects by gender: The effect on female employment is stronger than the effect on male employment.</p>
<p>Alaniz, Gindling and Terrell (2011) Country: Nicaragua Time period: 1998-2006 Regulation: Minimum wages Outcomes: Various measures of probability of formal employment, transitions between employment types and unemployment</p>	<p>Regression-based, panel. Identification based on changes in minimum wage levels (caused by changes in law) over time.</p>	<p>Formal employment: Higher minimum wages decrease formal employment. Informal employment: Higher minimum wages increase probability that private sector workers transition into informal economy (mostly towards unpaid family work) or leave the labour force. Unemployment: No evidence of increased unemployment due to higher minimum wage.</p>
<p>Gindling and Terrell (2009) Country: Honduras Time period: 1990-2004 Regulation: Minimum wages Outcomes: Formal employment, informal</p>	<p>Regression-based, panel. Minimum wages are sector-specific. Identification based on within-sector variation in minimum wages over time.</p>	<p>Formal employment: In larger firms, where there is evidence of compliance with regulation, higher minimum wages reduce employment. Informal employment: In smaller firms, where there is no evidence of compliance, higher</p>

employment, unemployment		minimum wages increase employment. In uncovered sectors (public and self-employment), there is no statistically significant relationship between minimum wages and employment. Unemployment: Some evidence that higher minimum wages may increase unemployment, but not robust across specifications.
Jones (1997) Country: Ghana Time period: 1970-1992 Regulation: Ratio of minimum wage / average wage Outcomes: Formal employment, Informal employment	Regression-based, time series and panel. Identification comes from variation in the ratio of real minimum wages to average wages.	Formal employment: Minimum wages reduce formal employment. Informal employment: Minimum wages increase informal employment. Results by gender: Minimum wages do not affect female employment.
<i>Studies Considering Industrial Disputes Act in India</i>		
Ahsan and Pagés (2008) Country: India Time period: 1959-1997 Regulation: Pro-worker/Pro-employer index of state amendments to Industrial Disputes Act from Besley and Burgess (2004), distinguishing between (1) restrictions on firing workers or closing for large firms, (2) employment protection legislation (EPL), and (3) rules on settling industrial disputes. Outcomes: Formal employment level (persons employed per capita, and production workers per capita)	Regression-based, panel. Identification based on variation created by some Indian states amending the Industrial Disputes Act to make it more pro-worker changes, with others amending the Act to make it more pro-employer.	Pro-worker EPL and Pro-worker dispute resolution amendments reduce persons employed per capita and production workers per capita. Restrictions on firing workers or closing for large firms reduce persons employed per capita in states where dispute resolution is also difficult. Most employment effects occur because of firm closures, not because of a reduction in the number of workers per firm.
Amin (2009)	Regression-based, cross-section. Identification	Labor regulations reduce retail employment in

<p>Country: India Time period: 2006 Regulation: Combination of index from Besley and Burgess (2004) and index of enforcement based on firm survey Outcomes: Employment levels in formal retail stores</p>	<p>based on variation in Besley and Burgess (2004) index and perceived enforcement index across states.</p>	<p>formal sector. Effects driven by permanent employment; effects on temporary employment insignificant.</p>
<p>Besley and Burgess (2004) Country: India Time period: 1958-1992 Regulation: Pro-worker and pro-employer amendments to Industrial Disputes Act of 1947 (including provisions regarding layoffs and dispute resolution) Outcomes: Formal employment</p>	<p>Regression-based, panel. Identification based on variation created by some Indian states amending the Industrial Disputes Act to make it more pro-worker changes, with others amending the Act to make it more pro-employer.</p>	<p>Formal employment: Pro-worker amendments reduce formal employment.</p>
<p>Fagnas (2007) Country: India Time period: 1980-2002 Regulation: Amendments to Industrial Disputes Act that facilitate enforcement and protect worker rights, and measures of court enforcement. Outcomes: Shares of industrial, service, agricultural, casual, and self-employment</p>	<p>Regression-based, panel. Identification based on variation in state amendments to Industrial Disputes Act (similar to Besley and Burgess 2004 measure) and variation in court efficiency for different states over time.</p>	<p>No consistent relationship between pro-worker regulation or judicial activity and employment shares. Results sensitive to model specification.</p>

With respect to minimum wages, the quality of the evidence for recent LICs is much higher than for current LICs. There are more studies, and the analytical methods are more rigorous. In contrast with the LIC studies, several of the recent LIC studies use panel data instead of simple cross-sectional or time-series data. The advantage of panel data is that it is immune to unchanging confounding factors (such as time invariant characteristics of different geographic areas) and to country-wide trends (such as economic growth and industrialization that affect all industries or all regions in the same way). Panel data methods only require that within-state (or within-industry) changes in minimum wages are uncorrelated with omitted factors that can explain employment outcomes. Although more tenable, this assumption might still be violated, especially in the cases where the relative minimum wage is changing mostly due to variation in average wages (since the measure used is often the minimum wage divided by average wage). To some extent, this issue is mitigated by studies that exploit variation arising from policy changes. The identification assumption in these studies is only that policy-makers were not responding to predictors of changes in employment when deciding to change the minimum wage. Moreover, the Alatas and Cameron (2009) study uses a quasi-experimental design, which exploits differing minimum wage changes in two neighboring urban areas. In one respect, there is concordance between the results of all of the minimum wage studies: that they reduce formal (or covered) employment while they increase informal (or uncovered) employment.

Outside of minimum wages, there is less evidence of the impact of labour regulations. Three out of four studies (Ahsan and Pagés 2009, Besley and Burgess 2004, Fagernas 2007) use panel methods to exploit variation in state-level regulations over time, thus mitigating the concerns associated with cross-sectional or time-series analysis, as discussed above. Two of these panel studies (Ahsan and Pagés 2009, Besley and Burgess 2004), along with Amin (2009), document that more stringent labour regulations decrease formal employment. Fagernas (2007) does not find a robust link between labour regulations and self-employment, although Besley and Burgess (2004) do show that more stringent labour regulations increase informal output, while Amin (2009) finds that firms in states with more stringent labour regulations report stronger competition from informal retailers. In that sense, these results are consistent with the findings on minimum wages. However, the evidence is limited to one country (India) and is focused on amendments to one specific labour regulation (the Industrial Disputes Act), so the generalizability of the results may be limited.

8.3 Evidence from Cross-Country Studies

We also include cross-country studies that consider at least one LIC; however, it is important to keep in mind that these results are empirically dominated by non-LIC countries, and that the results for LICs cannot be separately identified. We found only two cross-country studies that include at least one LIC and met the inclusion criteria outlined in Section 5. Table 8.3 summarizes evidence from these two studies.

The two cross-country studies examine different labour regulations and different outcomes. Both use composite measures of labour regulations: the number of ILO conventions ratified by a country (Hasan 2001), and various labour rigidity indicators from the World Bank's Doing Business database (Vandenberg 2010). Hasan (2001) focuses on formal employment levels, and finds that an increase in the number of ILO conventions

ratified by a country is correlated with a reduction in the formal employment rate. In contrast, Vandenberg (2010) examines overall unemployment rates, and does not find a significant relationship between the *Doing Business* indicators and overall unemployment. He does, however, find that countries with unemployment insurance schemes have higher overall unemployment rates.

Table 8.3 Evidence from Cross-Country Studies

Study/Setting	Method	Findings
<p>Hasan (2001) LICs included: Bangladesh, Haiti, Kenya, Madagascar, Malawi, Nepal, Togo, Zimbabwe Time period: 1970-1997 Regulations: Number of ILO conventions ratified, index of labour market rigidity that uses information on minimum wages, mandated benefits, trade unions and government employment Outcomes: Formal employment level</p>	<p>Regression-based, panel. Exploits variation in number of conventions ratified across countries and over time.</p>	<p>Negative relationship between number of ILO conventions ratified and formal employment level. There may be some interaction between trade barriers and labour rigidities, but evidence is mixed.</p>
<p>Vandenberg (2010) LICs included: Unknown. The paper indicates that two-thirds of the sample consists of low- and middle-income countries but the complete list is not provided. Time period: 2003-2005 Regulation: Various labour rigidities from World Bank's <i>Doing Business</i> index Outcome: Unemployment rate</p>	<p>Regression-based, panel. Exploits variation in labour rigidity and unemployment insurance schemes across countries and over time.</p>	<p>Labor rigidity is not associated with unemployment rate. However, existence of an unemployment insurance scheme is positively associated with unemployment rate.</p>

8.4 Evidence from a Meta-Regression Analysis

As shown in Tables 8.1 through 8.3, the studies we identified vary greatly in terms of the specific labour regulations and employment outcomes considered. However, we did identify nine studies that examined the impacts of minimum wages on formal employment. Using these studies, we attempted to identify estimates that are sufficiently

comparable to be used in a meta-regression analysis (MRA).⁴ As discussed widely in the economics MRA literature (e.g., Stanley 2001, Stanley 2008), some differences can be accommodated in the regression framework by the use of controls, but it is necessary that, at the minimum, all studies measure the same concept. Thus, for example, we cannot include in the same specification data from estimates of the impacts on employment with those that measure impacts on the unemployment rate.

The row entitled “Formal, elasticity” in Table 8.4 shows the studies that are included in our initial MRA, and presents the specific measures of minimum wages and employment used. The last column of Table 8.4 indicates which type of analysis (based on regression coefficients or partial correlations) was used, as discussed in more detail below. Ideally, we would focus on studies that estimate the elasticity of employment with respect to minimum wage (or that provide sufficient information so that such elasticities can be calculated). We identified four formal sector studies in this category. Two more studies, as well as some additional estimates from one of the four initially identified studies, look at impacts on formal employment, even though the presented estimates cannot be converted into elasticities. These additional studies and estimates, and the measures employed, are shown in the row of Table 8.4 entitled “Formal, inclusive.”

⁴ We identified only four minimum wage studies with comparable estimates in the informal sector. However, these studies used shares of informal employment rather than levels, and only contained a total of 18 results.. Our attempts to conduct an MRA for the informal sector yielded implausible results, likely due to the very small number of estimates; results are therefore not reported.

Table 8.4: Studies included in Meta-Regression Analysis

Estimate name	Studies and related outcome/minimum wage measures	Type of regression
Formal, elasticity	<p>Alatas and Cameron (2008): log(number of production workers), log(minimum wage)</p> <p>Bird and Manning (2003): log(formal workers), log(minimum wage)*crisis dummy^a</p> <p>Gindling and Terrell (2003): log(employment), log(minimum wage)</p> <p>Suryahadi et al. (2003): log(employment), log(minimum wage)</p>	t-stat of regression coefficients
Formal, inclusive	<p>All of the above PLUS</p> <p>Alatas and Cameron (2008): proportional change in number of workers, change in minimum wage</p> <p>Anderson et al. (1991): employment level, minimum wage dummy</p> <p>Alaniz et al. (2011): marginal probability of formal employment, change in log(minimum wage)</p>	t-stat of partial correlations
<p>^a For Bird and Manning (2003), we include the coefficients on minimum wage interacted with a dummy for the 1997 crisis that affected Indonesia, after which the authors argue that the minimum wage became binding.</p>		

Taken, together there are six studies yielding 76 estimates (described in the row “Formal, Inclusive” in Table 8.4). In order to make all of these estimates comparable, we calculated partial correlations (r).⁵

We start by conducting a graphical analysis to gauge whether the effect found in the qualitative review might be an artifice of publication bias. Figure 8.1 shows a funnel plot of the partial correlation coefficients for these six studies. Typically, an asymmetric graph

⁵ Partial correlations were calculated using the following formula:

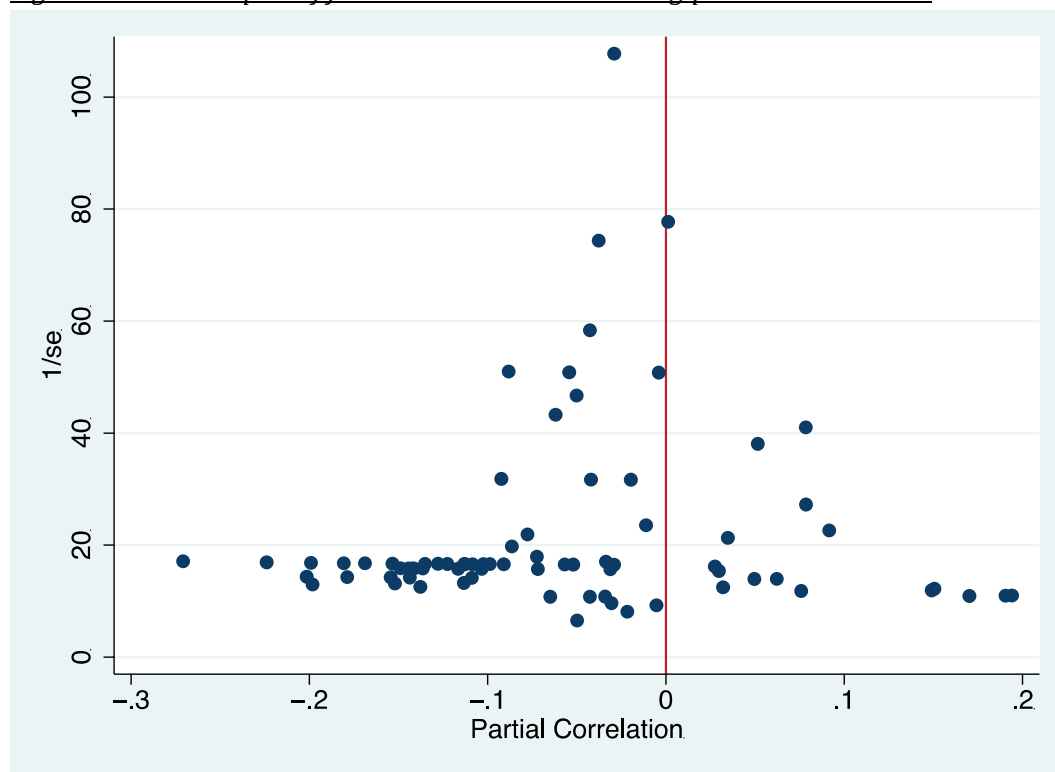
$$r = \frac{t}{\sqrt{t^2 + df}}$$

where r is the partial correlation, t is the t-statistic, and df is the number of degrees of freedom (assumed to be equal to the number of observations or clusters minus the number of regressors minus 1). The standard error of the partial correlation coefficient was calculated as:

$$se(r) = \sqrt{\frac{1-r^2}{df}}$$

indicates evidence of publication selection (Doucouliagos and Stanley 2009). The plot generally appears symmetric, and does not show strong evidence of publication bias (note that the symmetry does not have to be around zero).

Figure 8.1: Funnel plot of formal sector estimates using partial correlations



To more rigorously consider the potential for publication bias as well as the true effect of the minimum wage on formal employment, we estimated the following weighted-least-squares (WLS) version of a standard MRA model, following Doucouliagos and Stanley (2009):

$$t_i = \alpha_0 + \alpha_1(1/se_i) + v_i$$

where t is the t-statistic of the partial correlation between the dependent and independent variable and $(1/se)$ is one divided by the standard error of the partial correlation. These authors show that the constant can be interpreted as a measure of publication bias, while the coefficient on $(1/se)$ can be interpreted as the true effect that corrects for publication bias. It is important to note that the t-statistics and standard errors are those of the partial correlations and not the t-statistics and standard errors of the regression coefficients.

Table 8.5 presents results from the MRA for all six formal sector studies, using partial correlations. Column (1) is the most basic specification, using an ordinary least squares (OLS) specification and including only a constant and the inverse of the standard error. Column (2) employs a random effects (RE) specification. In both cases, standard errors are clustered at the study level, to account for within-study correlations.

Column (3) adds a few key moderator variables, using the OLS specification. We included a publication dummy by itself (as a “K” variable), and included the other variables as

dummies divided by the standard error (as “Z” variables). The Z variables are dummies equal to one if the effect looked only at unskilled workers or at female workers; and if panel data were used. All of these Z dummies were divided by the standard error of the partial correlation. As indicated by Doucouliagos and Stanley (2009), the K variables reflect the propensity that an estimate is reported, while the Z variables reflect the fact that these variables might affect the actual effect of the minimum wage on employment. We were cautious in our inclusion of moderator variables, to avoid having more regressors than clusters. Also, we tried to focus on those Z variables that appeared across multiple studies, to avoid picking up the results of only one particular study.

All of the coefficients on $(1/se)$ are negative, suggesting that minimum wage is negatively related to employment in the formal sector. In the first two specifications, which do not include any moderator variables, the coefficient on $(1/se)$ is significant at the 5% and 1% level respectively. This suggests that the negative effects of minimum wages on formal employment found in the literature are not driven entirely by publication bias. Column (3) presents the results that include moderator variables. To interpret these results we need to look at the hypothesis tests of sums of coefficients, which are presented in the bottom rows of the table. The joint F-tests of statistical significance indicate that higher minimum wages are associated with lower formal employment when the subpopulation considered is unskilled or female. We can reject the null hypothesis of no impact of formal employment among unskilled and female workers at the 10% and 1% levels of significance respectively. It is not surprising that the effects are only significant for unskilled workers since minimum wages are usually too low to be binding for skilled workers.

Table 8.5: Formal sector results using t-statistics of partial correlations.

	(1)	(2)	(3)
	Formal, Incl	Formal, Incl RE	Formal, Incl
1/Se	-0.017**	-0.022***	-0.00083
	(0.0052)	(0.0087)	(0.010)
Constant	-0.73	-0.66	-0.0036
	(0.50)	(0.47)	(1.19)
Unskilled/Se			-0.071**
			(0.027)
Female/Se			-0.12***
			(0.024)
Panel/Se			-0.034
			(0.019)
Published			-0.45
			(0.95)
Observations	76	76	76
Studies	6	6	6
R-squared	0.032		0.192
			Ho : 1/SE +Unskilled/SE=0 F(1,5)=16.13 ; Prob>F=0.079
			Ho : 1/SE+Female/SE=0 F(1,5)=2.40 ; Prob>F=0.010
			Ho : 1/SE+Panel/SE=0 F(1,5)=2.40 ; Prob>F=0.186
			Ho : Constant +Published=0 F(1,5)=1.08 ; Prob>F=0.35
<p>Dependent variable is t-statistic of partial correlation. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Standard errors are shown in parentheses, and are clustered at the level of the study.</p>			

We should note, however, that the small number of clusters presents a problem. The clustering of standard errors when the number of clusters is small might not be enough to avoid an over-rejection of the null hypothesis (Bertrand et al, 2004), which should lead to caution when interpreting these results.

The constant is statistically insignificant in all specifications, suggesting little evidence for publication bias. We further test whether this bias is present at least in published papers by testing whether the sum of the constant and the coefficient on the published dummy are different from zero, but we cannot reject the null of no publication bias in this case either. It is important to note, however, that the lack of evidence of publication bias is not the same as evidence of lack of publication bias, and this result may or may not be due to the low power of this test.

The disadvantage with using partial correlations as the dependent variable is that the results do not have an economic interpretation. That is, the most we can say based on the results of Table 8.5. is that there is a negative impact, but we cannot say anything about its size. To do so, we need to re-run the analysis using coefficients that are interpretable as elasticities. Table 8.6 presents the results of estimating the same equation as before, but where the t-values and standard errors are those of the regression coefficients from the specifications that can be interpreted as elasticities. As before, the standard errors are clustered at the study level. The coefficient on (1/se) suggests a minimum wage elasticity, corrected for publication bias, of about -0.08 in the formal sector. This result, however, derives from only the four studies named in the first row of Table 8.4.

Table 8.6: Formal sector results using t-statistics of regression coefficients (elasticities).

	Formal, Elas OLS
1/Se	-0.078**
	(0.016)
Constant	0.15
	(0.41)
Observations	50
Studies	4
R-squared	0.260
Dependent variable is t-statistic of regression coefficients (elasticities). *, ** and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Standard errors are shown in parentheses, and are clustered at the level of the study.	

Overall, our results confirm the effects we summarized in the narrative synthesis, namely: a higher minimum wage is associated with a lower formal sector employment, particularly among certain groups of workers such as unskilled workers. We do not find evidence of publication bias in the formal sector, and our results indicate that there is a true effect once we control for publication bias. When we restrict our estimates to those that can be interpreted as elasticities, we find an elasticity of about -0.08 in the formal sector.

Our results are subject to two main caveats. First, although we identified a substantial number of estimates, they come from very few studies. We clustered the standard errors to account for within-study correlation, but the fact remains that the MRA results are based on only six formal and four informal sector studies.

Second, the small number of studies translates into very few clusters in the regressions. Work by Bertrand et al. (2004) indicates that when data in a cluster are highly correlated and when there are few clusters (on the order of 10 or fewer), clustering tends to over-reject the null (although it is an improvement over not clustering the errors at all). Thus, although we make an effort not to over-reject the null by clustering errors at the study level, the above-mentioned work suggests that we should still interpret the statistical significance of our results cautiously.

9. Causal Chain Analysis

9.1 Summary of Results

Despite the small number of high-quality empirical studies on the impact of labour regulation on employment outcomes, by analyzing the evidence presented in Section 8 we can conclude that the evidence for LICs (and recent LICs) points to a negative effect of regulations on formal employment, and a compensating positive effect on informal employment. The effect on overall employment rates, and on unemployment, is ambiguous due to these opposing effects.⁶

Based on the included studies, Table 9.1 summarizes the effects of labour regulations on formal employment, informal employment and overall employment. We have separately analyzed studies according to the type of regulation examined. Note that the numbers in this table do not add up to the total number of studies (or the numbers of studies in the tables in Section 8) because some studies consider multiple labour regulations and outcomes.

As can be seen there, most of the 16 studies (including both individual country and cross-country studies) that look at formal employment find a statistically significant, negative effect of labour regulations on some aspect of formal employment. One exception is Fagernas (2007), who does not find a robust relationship between formal employment and two measures of labour regulation (dispute resolution regulations and an aggregate

⁶ As noted in Section 8, some of the study results are not robust to alternative specification or robustness tests, or show different results across different firms or groups or workers. Here, we focus on the preponderance of evidence from each study, and on the overall results (rather than, for example, the results for skilled versus unskilled workers).

measure). In addition, two of the studies do not find a negative relationship for all labour regulations they consider (Anderson et al. 2001, Ahsan and Pagés 2009). Anderson et al. (2001) document a negative relationship between minimum wages and formal employment, and between the right to unionize and skilled formal employment, but not between the right to unionize and overall formal employment. Meanwhile, Ahsan and Pagés (2009) find that EPL and severance pay reduce formal employment, but firing rigidities only reduce formal employment when dispute resolution is also difficult.

Meanwhile, of the seven studies that look at informal employment or self-employment, six find a statistically significant and positive effect. One of these five studies (Andalon and Pagés 2009) does not find a relationship between labour regulations and informal employment, but does find a positive relationship between labour regulations and self-employment. The only exception is Fagernas (2007), who does not find a robust relationship between labour regulations and self-employment. An important caveat is that these results are dominated by minimum wage results, so the results may not be generalizable to other labour regulations.

The four distinct studies that look at the overall employment or unemployment show mixed results: one documents a positive relationship between labour regulations and employment (Comola and de Mello 2011), two find no statistically significant relationship (Alaniz et al. 2011, Gindling and Terrell 2009), and one (Vandenberg 2010) finds a negative relationship for unemployment insurance but not for an overall index of labour rigidity.

As discussed in Section 8, the effects of labour regulations on employment among women versus men are ambiguous. None of the individual country LIC studies, or the cross-country studies that include LICs, provide results separately by gender. Four studies from recent LICs differentiate results by gender. Two of them (Comola and de Mello 2011, Jones 1997) find that the impacts of minimum wages on employment are attenuated for women. In contrast, a third (Suryahadi 2003) finds a stronger reduction in formal employment among female workers. Finally, Bird and Manning (2003) document decreases in formal employment among both men and women, but find that the ratio of informal to formal employment increases for men but not women.

Nonetheless, the evidence does suggest that minimum wage regulations in particular may affect relatively unskilled groups, for whom the minimum wage would be more likely to bind, to a greater extent. Two studies examining the increase in minimum wages in Indonesia find that the employment effects are more pronounced for unskilled workers (Suryahadi et al. 2003) and youth (Bird and Manning 2003); in fact, Suryahadi et al. (2003) find that increases in the minimum wage are actually correlated with increases in white-collar employment. Similarly, Gindling and Terrell (2003) document that minimum wages have the largest effects among the least educated workers.

Table 9.1 Summary of Effects on Formal, Informal, and Overall Employment

		Formal Sector Employment	Informal Sector Employment or Self-Employment	Overall Employment (or Reduction in Unemployment)
Minimum Wage	++		6	1
	0			2
	--	9		
Employment Protection Legislation	++			
	0			
	--	1		
Unemployment Insurance	++			
	0			
	--			1
Firing rigidities	++			
	0	1		
	--	2		
Unionization	++			
	0	1		
	--			
Dispute Resolution	++			
	0	1	1	
	--	1		
Aggregate Measures of Labour Regulation	++			
	0	1	1	1
	--	3		

++ statistically significant positive effect, 0 insignificant effects, -- statistically significant negative effects

Note that the numbers in this table do not add up to the total number of studies because some studies consider multiple labour regulations and outcomes, and studies that consider only adjustment speed are excluded.

9.2 Causal Chain Explanations

There are a number of channels through which labour regulations could affect employment outcomes. The effects of the main labour regulations in the included studies can be classified into two broad categories: a potential increase in the cost of labour in the covered sector (minimum wage legislation, the right to unionize, dispute resolution regulations), and a potential increase the cost or rigidity of firing labour in the covered sector (firing rigidities, employment protection legislation and the right to unionize).

Figure 9.1 illustrates various channels through which these increased costs could impact employment in both the formal and informal sectors, assuming that the formal sector is covered while the informal sector is not. One main channel is predicted by basic economic theory, which indicates that an increase in the cost of an input will decrease equilibrium demand for that input. An increase in labour cost could either be seen as an upward shift of the labour supply curve (in the case of, for example, union bargaining over wage rates) or as a floor on wages (in the case of a binding minimum wage). In either case, economic theory predicts that equilibrium demand for formal labour will fall, while equilibrium formal wages will rise. Similarly, firing rigidities or increased firing costs may make employers reluctant to hire new employees since it may be more difficult to lay them off in the future, thereby resulting in lower equilibrium employment.

Both types of labour regulations could also have a variety of other effects in the formal sector. Economic theory indicates that in a competitive market, inputs are compensated according to their marginal product. Therefore, an increase in the cost of labour (either in the present or the future, through firing rigidities or costs) may lead employers to demand increased productivity from employees, either by hiring more productive employees (for example, those with higher human capital) or by increasing the number of hours worked per employee.

Lucas and Fallon (1991, 1993) document several additional channels through which firing costs may affect the formal sector. First, such costs could reduce the speed of adjustment of the labour force. Second, employers could reduce costs by decreasing formal wages (assuming formal wages are set in a competitive market rather than by legislation or bargaining). Third, firing costs could decrease the productivity of the workforce by making it difficult to fire poor workers, by making employers more reluctant to take a chance on hiring workers, or by increasing the share of temporary workers with less firm-specific human capital. This decrease in productivity may actually lead to a compensating increase in formal sector employment.

A decrease in formal employment can have spillover effects to the informal sector if workers displaced from the formal sector move to the informal or self-employment sectors. Such movement would increase the supply of informal (or self-employed) labour, thus increasing equilibrium informal employment. Presumably, if informal wages are not constrained by regulations or wage bargaining in the informal sector, the informal wage will fall. These combined effects yield an ambiguous change in the overall employment level. (Conversely, if the potential increase in formal sector employment occurs, Figure 9.1 shows opposite effects in the informal sector.)

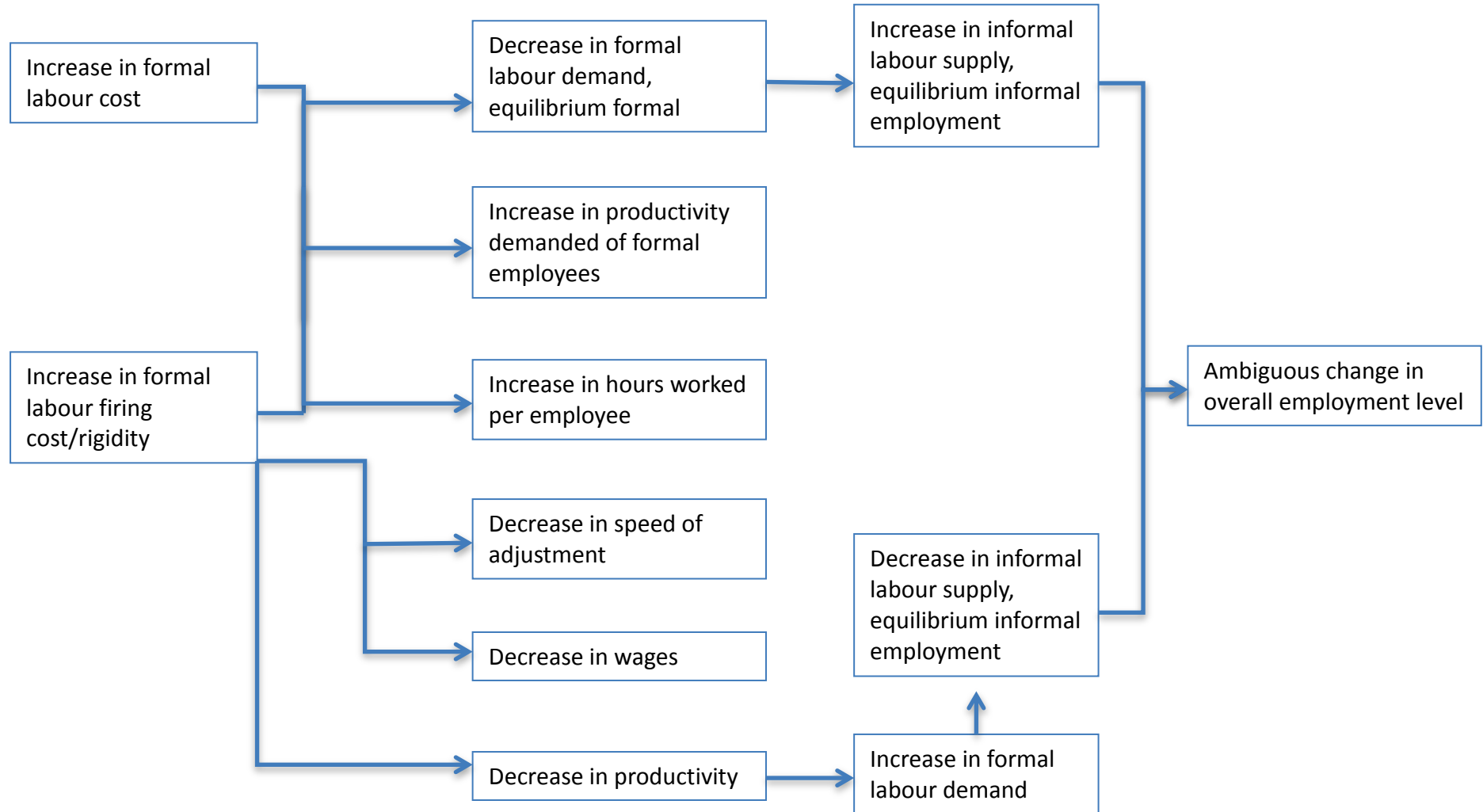
As discussed in Section 9.1, the evidence from the included studies generally supports the link between labour regulations and a decrease in the demand for formal labour, along with a resulting increase in informal labour, and ambiguous overall employment effects. Moreover, the study by Bird and Manning (2003) provides suggestive evidence that wages in household-production (used as a proxy for informal employment) fall, which is to be expected if the supply of informal labour increases.

The evidence on other effects in the formal sector is somewhat less clear. The studies showing that the effects of labour regulations tend to affect relatively unskilled and young workers (Bird and Manning 2003, Gindling and Terrell 2003, Suryahadi et al. 2003) provide some evidence suggesting that an increase in labour costs may lead employers to shift towards more productive employees. However, the two studies that focus on firing rigidities do not find evidence that laws increasing firing rigidity are associated with decreased adjustment speed or hours worked (Lucas and Fallon 1991, 1993).⁷ Moreover, while the evidence on workforce productivity is sparse, there is no support for a compensating increase in formal labour demand that outweighs the decrease in labour demand from other channels.

With respect to formal wages, we restrict our analysis to studies that look at regulations other than minimum wages, since the regulation itself would directly affect formal wages. The evidence is inconclusive. Anderson et al. (1991) find a positive relationship between unionization and formal wages for unskilled, but not skilled, workers. Besley and Burgess (2004) do not find any relationship between formal sector wages and labour regulations. This may be explained by results from Ahsan and Pagés (2009), who decompose the Besley and Burgess (2004) measures into various components and show that EPL is associated with higher formal wages, while dispute resolution regulations are associated with lower formal wages. Lucas and Fallon (1991, 1993) do not find any consistent evidence of lower formal sector wages when firing rigidities are increased. In the cross-country context, Hasan (2001) documents a positive relationship between number of ILO conventions signed and wages. The mixed results may be due to the differential impacts of labour regulations on different types of workers and firms. The results may also reflect the fact that wages in the formal sector are often set based on a variety of factors, including minimum wages and collective bargaining, as well as market forces. Studies that examine the effects of multiple labour regulations rather than just one regulation may therefore be better positioned to investigate changes in the labour market.

⁷ A study by Roy (2004), who considers similar regulations in India as did Lucas and Fallon (1991, 1993), confirms that the labour regulations are not associated with consistent changes in the speed of employment adjustment.

Figure 9.1 Potential Causal Links between Labour Regulations and Employment Outcomes



10. Limitations

Lack of studies on LICs. The main limitation of this systematic review is the relative dearth of studies that evaluate the impacts of labour regulations on employment outcomes in LICs. Our search strategy yielded only four studies on LICs that met our inclusion criteria. Moreover, we found only two cross-country studies that included one LIC and met our inclusion criteria; the results of these studies are likely to be driven by the much larger number of non-LICs they consider. By expanding our search to include countries that were recently LICs, we found an additional 11 studies that met our inclusion criteria. Conclusions based on such a small number of studies should naturally be cautiously interpreted.

Generalizability. Among the LIC studies, two (Lucas and Fallon 1991, Lucas and Fallon 1993) consider different outcomes of the same labour regulations in Zimbabwe (and India, which was an LIC at the time). The other two studies examine the impacts of minimum wages in Kenya and of minimum wages and unionization in Bangladesh. Among the recent LIC studies, four examine the impact of Indonesia's minimum wages, while another four examine the impacts of various aspects of India's Industrial Disputes Act. The remaining three studies consider the impacts of minimum wages in Ghana, Honduras, and Nicaragua. Combining these results with results from the individual country LIC studies yields results from a total of eight countries out of a possible 75 (35 LICs and 40 recent LICs). Therefore, our conclusions may not be applicable to most LICs and recent LICs, since most of the evidence is drawn from a small fraction of these countries.

Comprehensiveness. While our goal was to be comprehensive and systematic in searching the literature, it is always possible that relevant articles were missed, particularly among unpublished studies or grey literature. However, we believe that our search strategy, which included a number of databases of published literature, websites and databases of unpublished and grey literature, as well as snowballing and contacting experts, should mitigate this limitation.

11. Conclusions and Recommendations

Despite the limitations discussed in Section 10, we can conclude that the evidence for LICs (and recent LICs) points to a negative effect of regulations on formal employment, and a compensating positive effect on informal employment. The effect on overall employment rates, and on unemployment, is therefore ambiguous. The effect of labour regulations by gender is also ambiguous.

Lessons learned from studies in other developing countries generally lend support to these conclusions. As discussed in Section 3.3, our non-systematic review of the literature from other developing countries indicates that the majority of studies document a negative relationship between labour regulations and formal sector employment. However, it is important to note that we have not systematically reviewed the literature from all developing countries (since the focus of this study is on low-income countries only), and that other authors have documented publication bias in the case of minimum wage studies (Card and Krueger 1995, Doucouliagos and Stanley 2009). Therefore, although the broader

literature from developing countries generally supports our findings in LICs, this support should be cautiously interpreted.

The policy implications of our findings are mixed. On one hand, labour regulations create some protection for covered workers, and do not appear to have a strong negative effect on overall employment. On the other hand, the evidence suggests that labour regulations do change the composition of employment, shifting workers from formal to informal sectors. This creates a tradeoff, since labour regulations may increase protection for workers in the formal sector but at the same time result in fewer protected, formal jobs and more unprotected, informal jobs. In general, countries with higher levels of development have lower levels of informality (La Porta and Shleifer 2009). Our findings suggest that labour regulations may impede the movement of the labour force from the informal to the formal sector as LICs develop.

A second implication of our findings pertains to the dearth of rigorous evaluations of labour regulations in LICs. This lack of evidence may arise from several sources. First, labour regulations, particularly the changes in labour regulations that often trigger studies, may not be prevalent in LICs. Second, even if labour regulations are on the books, they may not be enforced, thus nullifying any impact on employment outcomes and making the study of such regulations rare. Third, LICs may not be able to devote the resources necessary to collecting the type of data (for example, labour force surveys) required for studying the effects of such regulations. Finally, given the large share of informal employment in many LICs, the issue of how labour regulations (which typically pertain only to the formal sector) affect employment outcomes may not be an issue of particular importance to policymakers in these countries. Our findings, however, suggest that labour regulations that pertain only to the formal sector have spillover effects in the informal sector, so this issue may warrant further study. Additional investigation of the importance of each of these factors is an important avenue for future research.

12. References (Included and Excluded Studies)

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LICs

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Cross-Country Studies

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Vandenberg, Paul (2010). Impact of Labor Market Institutions on Unemployment: Results from a Global Panel. ADB Economics Worker Paper Series No. 219, Asian Development Bank.

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This section lists studies that were coded, but subsequently excluded.

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Appendix A: List of Low-Income Countries and Recent Low-Income Countries

Low-income economies (\$1,005 or less)⁸

Afghanistan	Gambia, The	Myanmar
Bangladesh	Guinea	Nepal
Benin	Guinea-Bissau	Niger
Burkina Faso	Haiti	Rwanda
Burundi	Kenya	Sierra Leone
Cambodia	Korea, Dem Rep.	Somalia
Central African Republic	Kyrgyz Republic	Tajikistan
Chad	Liberia	Tanzania
Comoros	Madagascar	Togo
Congo, Dem. Rep	Malawi	Uganda
Eritrea	Mali	Zimbabwe
Ethiopia	Mozambique	

Recent low-income economies⁹

Albania	Guyana	São Tomé and Príncipe
Angola	Honduras	Senegal
Armenia	India	Solomon Islands
Azerbaijan	Indonesia	Sri Lanka
Bhutan	Lao PDR	Sudan
Bosnia and Herzegovina	Lesotho	Timor-Leste
Cameroon	Maldives	Turkmenistan
China	Mauritania	Ukraine
Congo	Moldova	Uzbekistan
Côte d'Ivoire	Mongolia	Vietnam

⁸ World Bank Country and Lending Groups, <http://data.worldbank.org/about/country-classifications/country-and-lending-groups>

⁹ Based on World Bank historical classifications, downloaded from <http://siteresources.worldbank.org/DATASTATISTICS/Resources/OGHIST.xls>

Egypt, Arab Rep.	Nicaragua	Yemen, Rep.
Equatorial Guinea	Nigeria	Zambia
Georgia	Pakistan	
Ghana	Papua New Guinea	

Appendix B: Detailed Search Strategy

Our final strategy resulted in two sets of searches. First, we searched specifically for *current* LICs, as originally proposed. The final coding of the relevant results yielded too few studies; of the 19 individual country studies selected for coding, only 4 met the inclusion criteria. After discussion with the DFID and MAER-Net teams, we expanded our country list to those nations that were *recent* LICs (see Appendix A). From this additional search an additional 19 studies were selected for coding, and 11 met the inclusion criteria. Although these two sets of searches were conducted sequentially, for ease of presentation, we have combined the descriptions of both sets below.

We conducted two types of traditional searches: complex and non-complex. We followed the procedure outlined in the protocol for complex searches in seven databases. We required a modified complex search approach for the eighth database, JSTOR, as described below. The complex searches yielded a total of 2,530 results.

We conducted non-complex searches in four databases. Two databases, Africabib and BLDS, required a modified search approach, as described below. The results of our non-complex search strategy yielded 75 titles from both sets of searches.

We then conducted two types of grey literature searches. We first searched for unpublished and working papers, in two additional databases, which yielded 258 results. Then we searched a number of websites, resulting in an additional 1,195 titles from both search sets.

Below we describe our initial search strategy for papers analyzing the impact of employment legislation on employment outcomes in current and recent LICs.

Traditional Searches

Complex Searches

We conducted two parallel searches. The first part searched for studies based in individual countries, and the second part looked for cross-country studies. We divided the search terms into three tiers. Tiers 1 and 2 were identical for both searches. Tier 3 included one set of terms for Part 1 where we searched for studies of individual LICs, and a second set of terms for Part 2 where we searched for cross-country studies that included at least one LIC. In addition, Tier 3 was expanded to include a Part 3, which searched for studies of individual, recent LICs. We restricted the searches to look for books, journals, or working papers published between 1990 and 2011. As described in our protocol, we selected search terms to mimic our inclusion criteria. We attempted to use a range of search terms to capture similar concepts, so as to minimize the risk of missing relevant articles.

The following terms were used in the searches:

Tier 1

All fields containing: "minimum wage" OR "minimum wages" OR "mandatory employee benefits" OR "separation compensation" OR "severance pay" OR "separation payment" OR "unemployment insurance" OR "unemployment benefit" OR "unemployment benefits" OR "employment tax" OR "labour tax" OR "labor tax" OR "payroll tax" OR "payroll taxes" OR

“hour restrictions” OR “hiring rigidity” OR “hiring rigidities” OR “firing rigidity” OR “firing rigidities” OR “termination benefit” OR “termination benefits” OR “job insecurity” OR “employment security” OR “labour rigidity” OR “labor rigidity” OR “labor rigidities” OR “labour rigidities” OR “collective bargaining” OR “labour market regulation” OR “labor market regulation” OR “labour regulation” OR “labor regulation” OR “employment law” OR “employment laws” OR “labour reform” OR “labor reform” OR “labour reforms” OR “labor reforms” OR “job security” OR “employment accident benefit” OR “employment injuries benefit” OR “employment accident benefit” OR “occupational accident compensation” OR “occupational disease compensation” OR “occupational injuries compensation” OR “rehabilitation benefit” OR “rehabilitation training allowance” OR “maintenance payment” OR “work injuries compensation” OR “work related accident compensation” OR “worker compensation” OR “workers compensation” OR “labor standards” OR “labour standards” OR “labor code” OR “labour code” OR “labor legislation” OR “labour legislation” OR “employer liability” OR “employer responsibility” OR “payroll tax” OR “payroll taxes” OR “payroll taxation” OR (“separation compensation” AND (mandatory OR regulatory OR regulated OR law OR legislation OR minimum)) OR (“indemnity” AND (mandatory OR regulatory OR regulated OR law OR legislation OR minimum)) OR (“dismissal compensation” AND (mandatory OR regulatory OR regulated OR law OR legislation OR minimum)) OR (“redundancy benefit” AND (mandatory OR regulatory OR regulated OR law OR legislation OR minimum)) OR (“redundancy payment” AND (mandatory OR regulatory OR regulated OR law OR legislation OR minimum)) OR “maternity protection” in Books or Journals or Working Papers or Book Chapters Published Between 1990 and 2011

AND

Tier 2

All fields containing: “employment” OR “unemployment” OR “job creation” OR “job destruction” OR “job growth” OR “hours worked” OR “number of jobs” OR “vacancies” OR “labour turnover” OR “labor turnover” OR “layoffs” or “new hires” in Books or Journals or Working Papers or Book Chapters Published Between 1990 and 2011

AND

Tier 3 (as described above, there were two searches, one aiming at individual country studies and the second search aimed at cross-country studies. Both were identical in the search terms in Tiers 1 and 2, but had different search terms in Tier 3)

For Part I (LICs)

All fields containing: Africa OR “Sub-Sahara” OR “sub-saharan” OR “sahara” OR “Central Asia” OR Caribbean OR Afghanistan OR Bangladesh OR Benin OR Burkina Faso OR “Upper Volta” OR Burundi OR Cambodia OR “Central African Republic” OR Chad OR Comoros OR Congo OR Zaire OR Eritrea OR Ethiopia OR Gambia OR Guinea OR “Guinea-Bissau” OR Haiti OR Kenya OR “North Korea” OR “Democratic People’s Republic of Korea” OR “DPRK” OR Kyrgyz OR Liberia OR Madagascar OR Malawi OR Mali OR Mozambique OR Myanmar OR Nepal OR Niger OR Rwanda OR “Sierra Leone” OR Somalia OR Somali OR Tajikistan OR Tanzania OR Togo OR Uganda OR Zimbabwe in Books or Journals or Working Papers or Book Chapters Published Between 1990 and 2011

For Part II (cross-country studies)

All fields containing: "multi country" OR "cross country" OR "panel data" "low income country" OR "low income countries" OR "low income nation" OR "low income nations" OR "poor country" OR "poor countries" in Books or Journals or Working Papers or Book Chapters Published Between 1990 and 2011

For Part III (recent LICs)

All fields containing: Albania OR Angola OR Armenia OR Azerbaijan OR Bhutan OR "Bosnia and Herzegovina" OR Bosnia OR Herzegovina OR Cameroon OR China OR Congo OR Zaire OR "Cote d'Ivoire" OR Egypt OR "Equatorial Guinea" OR Georgia OR Ghana OR Guyana OR Honduras OR India OR Indonesia OR Lao OR Lesotho OR Maldives OR Mauritania OR Moldova OR Mongolia OR Nicaragua OR Nigeria OR Pakistan OR "Papua New Guinea" OR Senegal OR "Solomon Islands" OR "Sri Lanka" OR Sudan OR "Sao Tome and Principe" OR "Sao Tome" OR Principe OR Timor-Leste OR Turkmenistan OR Ukraine OR Uzbekistan OR Vietnam OR Yemen OR Zambia in Books or Journals or Working Papers or Book Chapters Published Between 1990 and 2011

We intended to conduct this search process in eight databases that handle complex searches:

- Academic Search Elite
- Article First
- EconLit
- JSTOR
- WorldCat
- PAIS International
- Sociological Abstracts
- Social Science Citation Indexes

We successfully conducted the search process in seven databases where all of the search terms could be combined. However, JSTOR was not able to handle as many terms as included in our strategy. For example, there is a limit to the number of characters that can be searched at one time, searches for title and abstract have to be done separately, and it does not appear to allow unlimited combinations of search strings. As a result, we conducted an alternative strategy in that database. The modified approach carried out six separate searches. For each search, we selected entire categories of journals (African Studies, Asian Studies, Latin American Studies, Middle East Studies, Development Studies, and Population Studies) to ensure the maximum number of relevant results.

SEARCH 1:

(ti:(employment OR unemployment OR wage OR wages OR "employee benefits" OR payroll OR "collective bargaining" OR "occupational injury" OR "occupational injuries") OR ab:(employment OR unemployment OR wage OR wages OR "employee benefits" OR payroll OR "collective bargaining" OR "occupational injury" OR "occupational injuries")) AND (year:[1990 TO 2011]) AND la:(eng)

SEARCH 2:

Ti: "occupational disease" OR "occupational accident" OR "worker compensation" OR "workers compensation" OR "work injuries compensation" OR AB: "occupational disease" OR "occupational accident" OR "worker compensation" OR "workers compensation" OR "work injuries compensation" AND (year:[1990 TO 2011]) AND la:(eng)

SEARCH 3:

Ti: "labor standards" OR "labour standards" OR "labor code" OR "labour code" OR "labor legislation" OR "labour legislation" OR AB: "labor standards" OR "labour standards" OR "labor code" OR "labour code" OR "labor legislation" OR "labour legislation" AND (year:[1990 TO 2011]) AND la:(eng)

SEARCH 4:

Ti: "employer liability" OR "employer responsibility" OR "payroll tax" OR "separation compensation" OR indemnity OR "dismissal compensation" OR "redundancy compensation" OR "redundancy payment" OR AB: "employer liability" OR "employer responsibility" OR "payroll tax" OR "separation compensation" OR indemnity OR "dismissal compensation" OR "redundancy compensation" OR "redundancy payment" AND (year:[1990 TO 2011]) AND la:(eng)

SEARCH 5:

Ti:"maternity protection" OR "severance pay" OR "separation payment" OR "labor tax" OR "labour tax" OR hiring OR firing OR termination OR "job security" OR "job insecurity" OR AB: "maternity protection" OR "severance pay" OR "separation payment" OR "labor tax" OR "labour tax" OR hiring OR firing OR termination OR "job security" OR "job insecurity" " AND (year:[1990 TO 2011]) AND la:(eng)

SEARCH 6:

Ti:"labor law" OR "labor laws" OR "labour law" OR "labour laws" OR "labor reform" OR "labor reforms" OR "labour reform" OR "labour reforms" OR "labor regulation" OR "labor regulations" OR AB:"labor law" OR "labor laws" OR "labour law" OR "labour laws" OR "labor reform" OR "labor reforms" OR "labour reform" OR "labour reforms" OR "labor regulation" OR "labor regulations" AND (year:[1990 TO 2011]) AND la:(eng)

Non-complex Database Searches

In order to ensure our results captured as many studies on low-income countries as possible, we also searched four additional databases:

- African Journals Online (AJOL)
- Scielo
- africabib.org databases
- British Library of Development Studies (BLDS)

These databases did not allow for complex searches, so we conducted more general searches that did not require the results to meet all the three criteria of the complex searches. Rather, we included as many terms from Tier 1 and Tier 2 that the database allowed.

African Journals Online (AJOL)

We used a keyword search strategy with the following terms:

- Employment or unemployment
- Wage or wages
- Benefits or payroll
- “collective bargaining”
- “occupational injury” or “occupational injuries”
- “occupational disease” or “occupational diseases”
- Worker compensation
- Worker injury or worker injuries
- Occupational
- Labor or labour
- Employer or employers
- Payroll
- Compensation or payment
- Severance or separation

- Dismissal
- Termination
- “job security”
- Employee or employees

in Books or Journals or Working Papers or Book Chapters Published Between 1990 and 2011

Scielo

This database provides a list of subject headings from which the user selects the most relevant. We selected the following subject headings:

- Labor or labor inspection or labor legislation or labor market or labor relations or labor relations and employment
- Employed or employee or employee turnover model or employees or employer or employers or employes or employer or employing of employment or employment policy
- Wage or unemployment or unemployment insurance
- Collective labor process analysis
- Occupation or occupation therapy or occupational or occupational health or occupational therapy
- Worker or workers
- Job turnover

in Books or Journals or Working Papers or Book Chapters Published Between 1990 and 2011

Africabib

Initially, we used this strategy:

- Subject: Labor and Employment

The subject was combined with each of the following keywords:

- Employment or unemployment
- Wage or wages
- Benefits or payroll
- “collective bargaining”

- “occupational injury” or “occupational injuries”
- “occupational disease” or “occupational diseases”
- Worker compensation
- Worker injury or worker injuries
- Occupational
- Labor or Labour
- Employer or employers
- Payroll
- Compensation or payment
- Severance or separation
- Dismissal
- Termination
- “job security”
- Employee or employees

in Books or Journals or Working Papers or Book Chapters Published Between 1990 and 2011

This strategy resulted in too many titles (over 200 pages of citations). To ensure the search strategy yielded a manageable set of relevant results, we conducted the following search:

Subject: Labor and Employment

The subject was combined with a number of keywords, with only the exact keyword phrases allowed. The keywords were limited to:

"minimum wage" OR "minimum wages" OR "mandatory employee benefits" OR "separation compensation" OR "severance pay" OR "separation payment" OR "unemployment insurance" OR "unemployment benefit" OR "unemployment benefits" OR "employment tax" OR "labour tax" OR "labor tax" OR "payroll tax" OR "payroll taxes" OR "hour restrictions" OR "hiring rigidity" OR "hiring rigidities" OR "firing rigidity" OR "firing rigidities" OR "termination benefit" OR "termination benefits" OR "job insecurity" OR "employment security" OR "labour rigidity" OR "labor rigidity" OR "labor rigidities" OR "labour rigidities" OR "collective bargaining" OR "labour market regulation" OR "labor market regulation" OR "labour regulation" OR "labor regulation" OR "employment law" OR

“employment laws” OR “labour reform” OR “labor reform” OR “labour reforms” OR “labor reforms” OR “job security”

OR “employment accident benefit” OR “employment injuries benefit” OR “employment accident benefit” OR “occupational accident compensation” OR “occupational disease compensation” OR “occupational injuries compensation” OR “rehabilitation benefit” OR “rehabilitation training allowance” OR “maintenance payment” OR “work injuries compensation” OR “work related accident compensation” OR “worker compensation” OR “workers compensation” OR “labor standards” OR “labour standards” OR “labor code” OR “labour code” OR “labor legislation” OR “labour legislation” OR “employer liability” OR “employer responsibility” OR “payroll tax” OR “payroll taxes” OR “payroll taxation” OR “maternity protection”

in Books or Journals or Working Papers or Book Chapters Published Between 1990 and 2011

British Library of Development Studies (BLDS)

From the website blds.ids.ac.uk, we were not able to conduct an appropriate search. At best, we limited to pre-selected subject terms where the results could not be exported. We then found an alternative site (<http://opendocs.ids.ac.uk/opendocs/handle/123456789/3>) that allowed for a more focused search of the BLDS database. We conducted keyword and abstract searches to maximize the number of relevant results.

Abstract search query: "((abstract:employment or unemployment or "job creation" or turnover) AND (abstract:wage abstract:or abstract:wages abstract:or abstract:benefit abstract:or abstract:benefits abstract:or abstract:mandatory abstract:or abstract:compensation abstract:or abstract:termination abstract:or abstract:rigidity abstract:or abstract:rigidities abstract:or abstract:regulation abstract:or abstract:regulations abstract:or abstract:reform abstract:or abstract:reforms abstract:or abstract:security abstract:of abstract:insecurity abstract:or abstract:accident abstract:or abstract:accidents abstract:or abstract:injury abstract:or abstract:injuries abstract:or abstract:disease abstract:or abstract:diseases abstract:or abstract:training abstract:or abstract:labor abstract:or abstract:labour abstract:or abstract:regulations abstract:or abstract:regulatory abstract:or abstract:regulated abstract:or abstract:legislation abstract:or abstract:minimum abstract:or abstract:maternity))"

in Books or Journals or Working Papers or Book Chapters Published Between 1990 and 2011

Keyword search query: "((keyword:employment or unemployment or "job creation" or turnover) AND (keyword:wage keyword:or keyword:wages keyword:or keyword:benefit keyword:or keyword:benefits keyword:or keyword:mandatory keyword:or keyword:compensation keyword:or keyword:termination keyword:or keyword:rigidity keyword:or keyword:rigidities keyword:or keyword:regulation keyword:or keyword:regulations keyword:or keyword:reform keyword:or keyword:reforms keyword:or keyword:security keyword:of keyword:insecurity keyword:or keyword:accident keyword:or keyword:accidents keyword:or keyword:injury keyword:or keyword:injuries keyword:or

keyword:disease keyword:or keyword:diseases keyword:or keyword:training keyword:or keyword:labor keyword:or keyword:labour keyword:or keyword:regulations keyword:or keyword:regulatory keyword:or keyword:regulated keyword:or keyword:legislation keyword:or keyword:minimum keyword:or keyword:maternity))"

in Books or Journals or Working Papers or Book Chapters Published Between 1990 and 2011

Grey Literature

Search for Unpublished Articles

To avoid missing working papers or other unpublished studies, we used two search engines, IDEAS and JOLIS.

IDEAS

The searches were restricted to unpublished papers, written in English after 1990.

Search 1: (labour OR labor OR wages OR employment OR compensation OR employer OR employee OR occupational OR workers OR work) AND (law OR laws OR policy OR policies OR regulatory OR regulation OR regulations OR standard OR standards OR code OR codes OR legislation OR reform OR reforms) AND (developing OR "low income" OR poor) AND (country OR countries OR nation OR nations)

Search 2: (labour OR labor OR wages OR employment OR compensation OR employer OR employee OR occupational OR workers OR work) AND (law OR laws OR policy OR policies OR regulatory OR regulation OR regulations OR standard OR standards OR code OR codes OR legislation OR reform OR reforms) AND (africa OR african OR sahara OR saharan OR asia OR asian OR caribbean OR afghanistan OR bangladesh OR benin OR burkina OR volta OR burundi OR cambodia OR chad OR comoros OR congo OR zaire OR eritrea OR ethiopia OR gambia OR guinea OR haiti OR kenya OR korea OR dprk OR kyrgyz OR liberia OR madagascar OR malawi OR mali OR mozambique OR myanmar OR nepal OR niger OR russia OR leone OR solomon OR somalia OR somali OR tajikistan OR tanzania OR togo OR uganda OR zimbabwe)

Search 3: (labour | labor | wages | employment | compensation | employer | employee | occupational | workers | work) + (law | laws | policy | policies | regulatory | regulation | regulations | standard | standards | code | codes | legislation | reform | reforms) AND (Albania | Angola | Armenia | Azerbaijan | Bhutan | Bosnia | Herzegovina | Cameroon | China | Congo | Zaire | "Cote d'Ivoire" | Egypt | "Equatorial Guinea" | Georgia | Ghana | Guyana | Honduras | India | Indonesia | Lao | Lesotho | Maldives | Mauritania | Moldova | Mongolia | Nicaragua | Nigeria | Pakistan | "Papua New Guinea" | Senegal | "Solomon Islands" | "Sri Lanka" | Sudan | "Sao Tome and Principe" | "Sao Tome" | Principe | "Timor-Leste" | Turkmenistan | Ukraine | Uzbekistan | Vietnam | Yemen | Zambia)

JOLIS

The searches were restricted to working (research) papers, written in English after 1990.

Search 1: Subject "(labour OR labor OR wages OR employment OR compensation OR employer OR employee OR occupational OR workers OR work)" AND Subject "(law OR laws OR policy OR policies OR regulatory OR regulation OR regulations OR standard OR standards OR code OR codes OR legislation OR reform OR reforms)" AND Subject "developing countries"

Search 2: Title "(labour OR labor OR wages OR employment OR compensation OR employer OR employee OR occupational OR workers OR work)" AND Subject "developing countries"

Search 3: Title "(labour OR labor OR wages OR employment OR compensation OR employer OR employee OR occupational OR workers OR work)" AND Subject "(africa OR african OR sahara OR saharan OR asia OR asian OR caribbean OR afghanistan OR bangladesh OR benin OR burkina OR volta OR Burundi OR cambodia OR chad OR comoros OR congo OR zaire OR eritrea OR ethiopia OR gambia OR guinea OR haiti OR kenya OR korea OR dprk OR kyrgyz OR liberia OR madagascar OR malawi OR mali OR mozambique OR myanmar OR nepal OR niger OR Rwanda OR "sierra leone" OR "solomon islands" OR somalia OR somali OR Tajikistan OR Tanzania OR togo OR uganda OR zimbabwe)

Search 4: Subject "(labour OR labor OR wages OR employment OR compensation OR employer OR employee OR occupational OR workers OR work)" AND Subject "(law OR laws OR policy OR policies OR regulatory OR regulation OR regulations OR standard OR standards OR code OR codes OR legislation OR reform OR reforms)" AND Keywords anywhere "low income"

Search 5: Subject "(labour OR labor OR wages OR employment OR compensation OR employer OR employee OR occupational OR workers OR work)" AND Subject "(law OR laws OR policy OR policies OR regulatory OR regulation OR regulations OR standard OR standards OR code OR codes OR legislation OR reform OR reforms)" AND Subject "(Albania OR Angola OR Armenia OR Azerbaijan OR Bhutan OR Bosnia OR Herzegovina OR Cameroon OR China OR Congo OR Zaire OR "Cote d'Ivoire" OR Egypt OR "Equatorial Guinea" OR Georgia OR Ghana OR Guyana OR Honduras OR India OR Indonesia OR Lao OR Lesotho OR Maldives OR Mauritania OR Moldova OR Mongolia OR Nicaragua OR Nigeria OR Pakistan OR "Papua New Guinea" OR Senegal OR "Solomon Islands" OR "Sri Lanka" OR Sudan OR "Sao Tome and Principe" OR "Sao Tome" OR Principe OR Timor-Leste OR Turkmenistan OR Ukraine OR Uzbekistan OR Vietnam OR Yemen OR Zambia)

Website Search

We searched a variety of websites to find other grey literature.

African Development Bank

Topic search: Economic & Financial Governance, Gender (in English after 1990)

Asian Development Bank

Topic search: Employment and Labor Markets (in English after 1990)

International Labour Organization

A search for books and reports under the search topic of "developing countries."

A search for English language publications in developing countries with the following keywords:

Gender; Investment; Business; Women; Enterprise; Development; Training; Management; Unemployment; Decent; Work; Youth; Human; Development; Workers; Industry; Employment; Policy; Education; Health; Labour; Market; Population; Poverty; Globalization; Employment; Finance; Trade; Social; Policy; Statistics

USAID

In all searches below, the results were restricted to English publications after 1990.

Search 1: Employee relations, Employee benefits, Employment policy

Search 2: Wage scale, Wages

Search 3: Labor contracts, Labor disputes, Labor laws and legislation, Labor management, Labor policy, Labor regulations, Labor research, Labor unions, Laborers

Policy Pointer

Topic search: Employment, Industrial Relations & Training

Other websites

Searches of the DFID, ELDIS, GDNET and Institute of Development Studies sites did not yield any additional results.

In total, the results of the searches for current and recent LICs yielded 4,058 results, while snowballing yielded an additional six studies, for a total of 4,064 results. We then screened the studies as described in Section 5.2.3. A full summary of all search results is provided in Table 6.1.

Appendix C: Coding tool

A. Basic information

A.1 Bibliography

1. Title
2. Authors
3. Date of publication
4. Place of publication
5. Language

A.2 Publication Type

1. Peer reviewed journal
2. Book or book chapter
3. Institutional publication
4. Institutional working paper
5. Conference paper
6. Other (specify)

A.3 Funding Source

Specify if provided: _____

A.4 Type of study

1. Cross-country
2. Individual country/countries

A.5 Countries: Individual studies

1. Includes at least one LIC (if not, EXCLUDE and stop here)
List LIC countries.

A.6 Countries: Cross-country studies

1. Includes at least one LIC (if not, EXCLUDE and stop here)
2. Is it possible to separate impacts in LICs?
List LICs included.

A.7 Type of labour market regulation

1. Minimum wage
2. Mandatory employee benefits
3. Severance pay (separation compensation)
4. Unemployment insurance
5. Employment tax
6. Hour restrictions
7. Hiring rigidities
8. Firing rigidities
9. Collective bargaining
10. Other (describe)

Specify name of labour market law or regulation if applicable: _____

Describe labour market regulation (e.g., minimum wage; variable constructed to measure total mandatory employment taxes; number of months of severance pay required):

B. Data

B.1 Unit of observation

1. Country
2. State, province, or similar entity within a country
3. Firm
4. Household
5. Individual
6. Other (specify)

Specify number of units (e.g., 73 countries, 3000 firms): _____

Specify population if applicable (e.g., males aged 18-55): _____

B.2 Data Source

1. Secondary
2. Primary

Specify data source: _____

B.3 Nature of Data

1. One cross-section
2. Multiple cross-sections
3. Panel
4. Time series observations

Specify time period covered: _____

B.4 If primary data are used, record the following:

1. Population from which sample is drawn
2. Sample selection methods
3. Sample size
4. Evidence that consent was sought
5. Type of data collected
6. Data collection methods

B.5 Type of labour market

1. Formal sector only
2. Informal sector only
3. Formal and informal sectors
4. Not specified

C. Study Design

C.1 Identification Strategy

1. Cannot determine identification strategy (EXCLUDE and stop here)
2. Experimental
3. Quasi-Experimental
4. Regression-Based
5. Cross-Country, Panel Analysis
6. Cross-Country, Non-Panel Analysis (EXCLUDE and stop here)
7. Other (specify)

C.2 Data Analysis Methods

1. Cross-sectional regressions

2. Panel regressions
3. Time series regressions
4. Instrumental variables methods
5. Natural experiments (e.g., regression discontinuity design)
6. Statistical matching techniques (e.g., propensity score approach)
7. Structural models
8. Comparison of means (treatment and control groups)
9. Qualitative comparison
10. Other (specify)

C.3 Confounding factors

1. Confounding factors not discussed
2. Confounding factors discussed but not significant
3. Significant confounding factors present; not addressed convincingly
4. Significant confounding factors present; addressed convincingly by use of identification strategy, control variables, etc.

C.4 Variable measurement

1. No systematic reproducible approach to variable measurement is employed
2. No indication of how variables were constructed or obtained
3. Some attention to constructing or obtaining high quality measures
4. Variables developed or selected with some consideration of use in prior studies and reliability of measurement
5. Careful selection of relevant variables considering their prior use and reliability for all or most of the measures

C.5 Control for missing data or attrition

1. Missing data and/or attrition not discussed
2. Missing data and/or attrition not a significant issue
3. Missing data and/or attrition may be a significant issue, not adequately addressed
4. Missing data and/or attrition may be a significant issue, adequately addressed

C.6 Use of statistical significance tests

1. No statistical tests or effect sizes

2. Statistical tests used or effect sizes computed
3. Statistical tests or effect sizes not relevant

STUDY QUALITY: Based on the information extracted, focusing particularly on the elements of the study design, evaluate the execution of the study:

1. No reliance or confidence should be placed on the results of this evaluation because of the number and type of serious shortcomings(s) in the methodology employed (EXCLUDE and stop here)
2. Methodology rigorous in some respects, weak in others
3. Methodology rigorous in almost all respects

Also evaluate the study according to the following two areas:

Is the method used in the study relevant for the review question?

Yes

No (EXCLUDE and stop here)

Is the topic focus or context of the study relevant to the review question?

Yes

No (EXCLUDE and stop here)

D. Outcomes

D.1 Relevant Outcomes Assessed

1. Employment level
2. Employment growth
3. Unemployment rate
4. Hours worked
5. Days worked
6. Dummy variable for employment
7. Earnings
8. Layoffs
9. Size of formal workforce
10. Size of informal workforce
11. Other (specify)

D.2 Are the employment outcomes differentiated by gender?

___ Yes

___ No

E. Additional Moderator Variables (for minimum wage studies)

E.1 Standard error (if applicable)_____

E.2 t-statistic (if applicable)_____

E.3. Age of population included

1. Adults only
2. Minors only
3. Adults and Minors

E.4 Gender of population included

1. Male only
2. Female only
3. Male and Female

E.5 Specification

1. Log-log
2. Log-linear
3. Other (specify)

E.6 Lagged versus current regulation

1. Lagged regulation
2. Current regulation

E.6 Industries included: _____

E.7 Are the following controls included?

Control	Yes	No
Time trend		
Year dummy variables		
Industry dummy variables		
Country dummy variables		
Region dummy variables		
Unemployment		
Education variable		

Specify employment outcomes, including differences by gender if available: _____

Appendix D: List of Studies of Labour Regulation used to Select the Complex Search Terms

- Ahsan, Ahmad, Pagés, Carmen (2009). Are all labor regulations equal? Evidence from Indian manufacturing. *Journal of Comparative Economics* 37 (1), 62-75.
- Amin, Mohammad (2009). Labor regulation and employment in India's retail stores. *Journal of Comparative Economics* 37 (1), 47-61.
- Bell, Linda A. The Impact of Minimum Wages in Mexico and Colombia, *Journal of Labor Economics*, 1997, Vol. 15, No. 3, pp 103-135
- Besley, Timothy, Burgess, Robin (2004). Can labor regulation hinder economic performance? Evidence from India. *Quarterly Journal of Economics* 119 (1), 91-134.
- Bhattacharjea, Aditya (2006). Labour market regulation and industrial performance in India: A critical review of the empirical evidence. *Indian Journal of Labour Economics* 49 (2), 211-232.
- Caballero, Ricard, Cowan, Kevin, Engel, Eduardo, Micco, Alejandro (2004). Effective labor regulation and microeconomic flexibility, Mimeo. Department of Economics, MIT, Cambridge, MA.
- Djankov, Simeon, Ramalho, Rita (2009), Employment laws in developing countries, *Journal of Comparative Economics* 37, 3-13.
- Downes, Andrew, Mamingi, Nlandu, Antoine, Rose-Marie (2004). Labor market regulation and employment in the Caribbean. In: James, Heckman, Pagés, Carmen (Eds.), Law and Employment: Lessons from Latin America and the Caribbean. The University of Chicago Press, Chicago.
- Fallon, Paul, Lucas, Robert (1991). The impact of changes in job security regulations in India and Zimbabwe. *World Bank Economic Review* 5 (3), 395-413.
- Fallon, Paul, Lucas, Robert (1993). Job security regulations and the dynamic demand for industrial labor in India and Zimbabwe. *Journal of Development Economics* 40, 214-275.
- Heckman, James, Pagés, Carmen (2000). The Cost of Job Security Regulation: Evidence from the Latin American Labor Markets. *Journal of the Latin American and Caribbean Economic Association*, 1(1), 109-154.
- Kaplan, David S. (2009). Job creation and labor reform in Latin America. *Journal of Comparative Economics* 37 (1), 91-105.
- Kugler, Adriana (1999). The impact of firing costs on turnover and unemployment: Evidence from the Colombian labor market reform. *International Tax and Public Finance* 6, 389-410.
- Kugler, Adriana (2004). The Effect of Job Security Regulations on Labor Market Flexibility: Evidence from the Colombian Labor Market Reform. NBER Working Paper No. 10215.
- Maloney, William, Nuñez, Jairo (2001). Measuring the impact of minimum wages, evidence from Latin America. Policy Research Working Paper 2597.
- Mondino, Guillermo, Montoya, Silvia (2004). The effect of labor market regulations on employment decisions by firms: Empirical evidence for Argentina. In: Heckman, James,

Pagés, Carmen (Eds.), Law and Employment: Lessons from Latin America and the Caribbean. The University of Chicago Press, Chicago.

Montenegro, Claudio, Pagés, Carmen (2004). Who benefits from labor regulation? Chile 1960-1998. In: Heckman, James, Pagés, Carmen (Eds.), Law and Employment: Lessons from Latin America and the Caribbean. The University of Chicago Press, Chicago.

Pagés, Carmen, Montenegro, Claudio (2007). Job security and the age-composition of employment: Evidence from Chile. *Estudios de Economía* 34 (2), 165-187.

Rama, Martin (2001). The Consequences of Doubling the Minimum Wage: The Case of Indonesia. *Industrial and Labor Relations Review*, Vol. 54, No. 4, 864-881.

Saavedra, Jaime, Torero, Máximo (2004). Labor market reforms and their impact over formal labor demand and job market turnover: The case of Peru. In: Heckman, James, Pagés, Carmen (Eds.), Law and Employment: Lessons from Latin America and the Caribbean. The University of Chicago Press, Chicago.

Appendix E: List of Included Studies and Quality Appraisal

Study	Quality Appraisal
LICs	
Andalón, Mabel, Pagés, Carmen (2008). Minimum Wages in Kenya. Discussion Paper No. 3390, Institute for the Study of Labor (IZA).	Methodology rigorous in some aspects, weak in others. Regression-based, cross-sectional identification strategy; confounding factors not discussed (and authors note that showing causality is not possible); variables carefully selected; missing data convincingly addressed; statistical tests and effect sized computed.
Anderson, Kathryn H., Hossain, Najmul, Sahota, Gian S. (1991). The Effect of Labor Laws and Labor Practices on Employment and Industrialization in Bangladesh. <i>The Bangladesh Development Studies</i> 19 (1-2), 131-156.	Methodology rigorous in some aspects, weak in others. Regression-based, cross-sectional identification strategy; confounding factors not addressed convincingly; variables selected with some consideration of use in previous studies and reliability; missing data not adequately addressed; statistical tests and effect sized computed.
Fallon, Paul R., Lucas, Robert E.B. (1991). The impact of changes in job security regulations in India and Zimbabwe. <i>World Bank Economic Review</i> 5 (3), 395-413. Fallon, Peter R., Lucas, Robert E.B. (1993). Job security regulations and the dynamic demand for industrial labor in India and Zimbabwe. <i>Journal of Development Economics</i> 40, 241-275.	Methodology rigorous in some aspects, weak in others. Regression-based, time series identification strategy; confounding factors addressed convincingly in India but not Zimbabwe; variables carefully selected; missing data not a significant issue; statistical tests and effect sized computed.
Recent LICs	
Ahsan, Ahmad, Pagés, Carmen (2009). Are all labour regulations equal? Evidence from Indian manufacturing. <i>Journal of Comparative Economics</i> 37, 62-75.	Methodology rigorous in almost all aspects. Regression-based, panel identification strategy; confounding factors addressed convincingly; variables carefully selected; missing data not discussed; statistical tests and effect sized computed.
Alaniz, Enrique, Gindling, T.H., Terrell, Katherine (2011). The	Methodology rigorous in almost all aspects. Regression-based,

Impact of Minimum Wages on Wages, Work and Poverty in Nicaragua. Discussion Paper No. 5702, Institute for the Study of Labor (IZA).	panel identification strategy; confounding factors addressed convincingly; variables selected with some consideration of use in previous studies and reliability; missing data not a significant issue; statistical tests and effect sized computed.
Alatas, Vivi, Cameron, Lisa A. (2008). The Impact of Minimum Wages on Employment in a Low-Income Country: A Quasi-Natural Experiment in Indonesia. <i>Industrial & Labor Relations Review</i> 61(2), 201-223.	Methodology rigorous in almost all aspects. Quasi-experimental, regression-based identification strategy; confounding factors addressed convincingly; variables carefully selected; missing data convincingly addressed; statistical tests and effect sized computed.
Amin, Mohammad (2009). Labor regulation and employment in India's retail stores. <i>Journal of Comparative Economics</i> 37, 47-61.	Methodology rigorous in some aspects, weak in others. Regression-based, cross-sectional identification strategy; some confounding factors addressed convincingly; variables selected with some consideration of use in previous studies and reliability; missing data not convincingly addressed; statistical tests and effect sized computed.
Besley, Timothy, Burgess, Robin (2004). Can labour regulation hinder economic performance? Evidence from India. <i>Quarterly Journal of Economics</i> 119 (1), 91-134.	Methodology rigorous in almost all aspects. Regression-based, panel identification strategy; confounding factors addressed convincingly; variables carefully selected; missing data not significant; statistical tests and effect sized computed.
Bird, Kelly, Manning, Chris (2003). Impact of Minimum Wage Policy on Employment and Earnings in the Informal Sector: The Case of Indonesia. Received from contacting author, Working Paper, Division of Economic, Research School of Pacific and Asian Studies, Australian National University.	Methodology rigorous in almost all aspects. Regression-based, panel identification strategy; confounding factors addressed convincingly; variables carefully selected; missing data convincingly addressed; statistical tests and effect sized computed.
Comola, Margherita, de Mello, Luiz (2011). How does decentralized minimum wage setting affect employment and informality? The case of Indonesia. <i>Review of Income and Wealth</i> 57(Special Issue), S79-S99.	Methodology rigorous in almost all aspects. Regression-based, panel identification strategy; some confounding factors addressed convincingly; variables carefully selected; missing data not significant; statistical tests and effect sized computed.

Fagernas, Sonja (2007). Labour Law, Judicial Efficiency and Informal Employment in India. Working Paper No. 353, Centre for Business Research, University of Cambridge.	Methodology rigorous in almost all aspects. Regression-based, panel identification strategy; confounding factors not addressed convincingly; variables carefully selected; missing data convincingly addressed; statistical tests and effect sized computed.
Gindling, T.H., Terrell, Katherine (2009). Minimum wages, wages and employment in various sectors in Honduras. <i>Labour Economics</i> , 16(3), 291-303.	Methodology rigorous in almost all aspects. Regression-based, panel identification strategy; confounding factors addressed convincingly; variables selected with some consideration of use in previous studies and reliability; missing data not a significant issue; statistical tests and effect sized computed.
Jones, Patricia (1997). The impact of minimum wage legislation in developing countries where coverage is incomplete. Working Paper Series 98-2, The Centre for the Study of African Economies.	Methodology rigorous in some aspects, weak in others. Regression-based, time-series and panel identification strategies; confounding factors not discussed; variables selected with some consideration of use in previous studies and reliability; missing data not a significant issue; statistical tests and effect sized computed.
Suryahadi, Asep, Wiyanti, Wenefrida, Perwira, Daniel, Sumarto, Sudarno (2003). Minimum wage policy and its impact on employment in the urban formal sector. <i>Bulletin of Indonesian Economic Studies</i> 39(1), 29-50.	Methodology rigorous in some aspects, weak in others. Regression-based, panel identification strategy; confounding factors not addressed convincingly; variables carefully selected; missing data not discussed; statistical tests and effect sized computed.
Cross-Country Studies	
Hasan, Rana (2001). The Impact of Trade and Labor Market Regulations on Employment and Wages: Evidence from Developing Countries. Working Paper No. 32, East-West Center.	Methodology rigorous in almost all aspects. Regression-based, panel identification strategy; confounding factors addressed convincingly; variables carefully selected; missing data adequately addressed; statistical tests and effect sized computed.
Vandenberg, Paul (2010). Impact of Labor Market Institutions on Unemployment: Results from a Global Panel. ADB Economics Worker Paper Series No. 219, Asian Development Bank.	Methodology rigorous in almost all aspects. Regression-based, panel identification strategy; confounding factors addressed convincingly; variables carefully selected; missing data not significant; statistical tests and effect sized computed.