

# Implications of Minimum Wage Increases on Labor Market Dynamics Lessons for Emerging Economies

*Ximena V. Del Carpio*

*Laura M. Pabon*



**WORLD BANK GROUP**

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## Abstract

This paper offers evidence on the relationship between the minimum wage and unemployment and informal employment, and identifies some of the lessons learned on the potential effects of increasing the minimum wage. Most of the evidence suggests that sizable increases in the minimum wage are likely to exacerbate unemployment and the prevalence of informal employment, which could have negative consequences for labor productivity and businesses as a result of reduced investment in employee training and loss of productive workers. This outcome occurs when businesses adopt the main channels available for absorbing increased labor costs. The majority of the empirical evidence suggests that the effects of minimum wage increases on unemployment and the demand for labor are unclear. The outcome depends in large part on the specific characteristics of the

labor markets and the degree of compliance with the minimum wage law. Most of those affected by minimum wage increases are less qualified workers. In Latin American and Asia, differences in the effects of minimum wage increases depend largely on the size and type of firms. In countries with high levels of informal employment, minimum wage increases can increase informal employment, since the formal workers who lose their jobs are absorbed by the informal sector of the economy. In general, businesses have five mechanisms for absorbing the added labor costs. Given the characteristics of the labor market in emerging economies, it is likely that businesses faced with increased labor costs will resort to less than optimal channels, which will tend to affect their productivity and the labor market in general.

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**Ximena V. Del Carpio**  
World Bank Group

**Laura M. Pabon**  
Planning Department of Colombia

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## INTRODUCTION<sup>1</sup>

Some countries look upon the minimum wage as a key tool for reducing poverty and inequality because it benefits low-earning workers. Other countries see it is a means of increasing labor productivity. Still others consider it the best tool for correcting inefficiencies in the labor market. While there have been efforts to achieve all three of these objectives through the management of minimum wage policy, as it will be seen later below, the minimum wage may not be capable of meeting all these goals at the same time (Del Carpio, Pabon, 2014).

From the theoretical and empirical perspective, the effect of the minimum wage on the labor market and informality is not entirely clear. Hence, the primary aim of this review of the literature is to understand the potential impact of the minimum wage on unemployment, growth of the informal sector, and other indicators of labor demand, as well as the ways in which higher levels of unemployment and informal employment might affect the productivity of firms. The second aim is to review the various adjustments that businesses make in order to absorb the increase in labor costs, some of which can ultimately affect productivity in the economy as a whole.

Much of the empirical evidence on the effects of the minimum wage on the labor market comes from developed countries, but in recent years the volume of studies on developing countries has increased, giving us a more comprehensive picture of the consequences of the minimum wage in emerging economies. Much of the literature finds that the effects are to lower levels of employment and growth of the informal sector, especially when the minimum wage is set at a very high level. Typically, increases in unemployment and informal employment can have negative implications for a company's productivity and for the economy, since there is a reduction in the contribution of workers toward generating goods and services. If the increases in the minimum wage are significant, the company may see itself forced to lay off not only its less productive workers, but also those who have skills and experience that are valuable for carrying out its mission. From the company's perspective, an increase in the participation of informal workers might enable it to reduce its investment in training because these workers are not bound by an employer-employee relationship that guarantees it can reap the benefits of the investment.

This document is divided into six sections. The first section presents the theoretical issues related to the minimum wage (or an increase therein) on unemployment and informal employment. The second section looks at the effect of minimum wage on unemployment. The third section considers the effects of minimum wage on informal employment. The fourth section describes the main adjustment channels used by businesses in response to minimum wage increases. The fifth section reviews the main lessons learned from international experience that might be applied by emerging economies.

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<sup>1</sup> This document was prepared by the World Bank Group, Social Protection and Labor Global Practice.

# IMPACTS ON EMPLOYMENT, WITH EMPHASIS ON LABOR PRODUCTIVITY

## Summary of the Principal Findings

This document offers evidence on the relationship between the minimum wage and unemployment and informal employment and identifies some of the lessons learned regarding the potential effects of increasing the minimum wage. Most of the evidence suggests that sizable increases in the minimum wage are likely to exacerbate unemployment and the prevalence of informal employment, which could have negative consequences for labor productivity and for businesses as a result of reduced investment in employee training and loss of productive workers. This outcome occurs when businesses adopt the main channels available for absorbing increased labor costs. The following section summarizes several key observations from the literature regarding this response.

- **The burden of empirical evidence suggests that the effect of minimum wage increases on unemployment and the demand for labor is unclear. The outcome depends in large part on the specific characteristics of the labor markets and on the degree of compliance with the minimum wage law.** Empirically, authors have not yet reached a consensus on the effect of the minimum wage on unemployment and labor demand. However, the evidence so far shows that the impact of minimum wage increases will depend on how competitive the market is, the level of employment and informal employment in the economy, the overall performance of the economy, the size of the increase, the level of the minimum wage relative to the median wage, the productivity of workers, the degree of compliance with the policy, and the percentage of workers who earn more than the minimum wage, among other factors.
- **Most of those affected by minimum wage increases are the less qualified workers.** A significant share of the literature from developed and developing countries indicates that a minimum wage increase has a disproportionate effect on the less qualified groups of workers (women, young workers, and inexperienced workers), whose labor productivity is below the minimum standard. Since these workers would be affected by upward adjustments, it is essential to adopt measures to improve their labor productivity through in-service training.
- **In Latin America and Asia, differences in the effects of minimum wage increases depend largely on the size and type of firms.** In Honduras and Nicaragua, the greatest job losses occurred in large corporations where there is greater compliance with minimum wage legislation. At the same time, Honduras saw increases in employment in small businesses, which could mean that these businesses picked up some of the labor force that was laid off by the larger employers. On the other hand, empirical evidence from Indonesia indicates that

greater job losses were seen in the smaller businesses, which had less capacity to absorb the increased labor costs, while in Vietnam the losses occurred mainly in domestic businesses.

- **In countries with high levels of informal employment, minimum wage increases can increase informal employment, since the formal workers who lose their jobs are absorbed by the informal sector of the economy.** Theoretically, minimum wage increases can boost informal sector employment because the workers who lost their jobs in the formal sector are absorbed by the informal sector of the economy, or else because businesses faced with higher labor costs stop paying social benefits for some of their workers. And, in fact, a number of countries, including Nicaragua, Costa Rica (for several years), Honduras, Indonesia, and South Africa, have found that minimum wage increases have led to increases in informal employment, mainly because workers from the modern sector of the economy have shifted to informal employment. However, empirical evidence on informal employment is inconsistent in other contexts, especially in countries with less informal employment.
- **Generally speaking, businesses have five mechanisms for absorbing the added labor costs.** It was found that businesses use five different mechanisms, or adjustment channels, to adapt to wage increases. The first is to reduce their profits. The second is to raise the prices of products and/or services, or else reduce production costs or other non-wage costs so that they do not affect the firm's profits or earnings. Reducing production costs would clearly impact the quality of its products. The third mechanism is to reorganize a company's internal human resource structure. The fourth is to drop out of the formal labor market entirely, or at least partially, and operate informally. With the fifth, and last, mechanism a business can choose to increase its investments in human capital and physical capital, such as machinery and technology.
- **Given the characteristics of the labor market in emerging economies, it is likely that businesses faced with increased labor costs will resort to less than optimal channels, which will tend to affect both their productivity and the labor market in general.** Since emerging economies are typically characterized by a high proportion of informal labor, monopsonistic markets, and little unionization and collective bargaining, businesses faced with increased labor costs might be expected to resort to two types of adjustments that can be prejudicial for the labor market, productivity, and the economy in general. One of them is to hire informal labor and the other is to make changes in their internal personnel structure that place the jobs of less productive workers in jeopardy. In the latter case, businesses often replace less productive employees with workers who are more productive. It is therefore suggested that steps be taken to identify the companies at greatest risk of violating the minimum wage laws and offer them some form of government assistance to discourage them from using negative adjustment channels. Programs should also be introduced for workers likely to be negatively affected, in order to prevent them from entering the informal sector. Make sure to differentiate between short and medium term measures, as some of the measures will be too costly to be sustained over time.

## 1. BASIC MINIMUM WAGE PRINCIPLES

The perfect competency model in conventional economic theory holds that setting the minimum wage above the marginal productivity value of workers will lead to unemployment. The size of the reduction in employment will depend on the elasticity of the demand for labor. In other market models, however, it is also possible for a rise in the minimum wage to increase the demand for labor. For example, in a monopsonistic labor market employers are able to pay less than that the wages in a competitive market. The introduction of a minimum wage would force these employers to pay more than the monopsonistic wage. Thus, if the minimum wage is set higher than the monopsonistic wage but lower than the perfect competence wage, it is possible to increase the level of employment.

Efficiency wage theory also supports the concept that minimum wage increases can result in higher employment. This theory maintains that higher wages can increase worker productivity, thereby reducing the cost of employee oversight. Thus, while introducing or increasing the minimum wage would increase the average cost per worker, at the same time it would reduce marginal labor costs (the cost of layoffs is greater because there are more levels of employment). In this scenario, businesses would then have more resources and more incentives to hire new workers (Rebitzer and Taylor, 1995).

Empirical evidence on the relationship between the minimum wage and employment is inconsistent. Much of the literature identifies aggregate effects such as reductions in formal employment and number of hours worked, increased unemployment, and more informal labor, especially when the minimum wage is very high. However, moderate minimum wage increases do not necessarily generate significant job losses, though they have less of an impact on poverty levels and wages overall (Rutkowski, 2003). In labor markets characterized by imperfect competence, moderate minimum wage increases can send a signal in situations where information is asymmetric and/or there is need to correct distortions in monopsonistic markets where employers have excessive control over the labor market supply and keep wages low relative to local conditions. One of the side effects of formal employee layoffs and increased informal employment is reduced or sluggish productivity because businesses have lost productive workers and have little incentive to invest in training the workers they have hired on an informal basis.

Businesses resort to various strategies to absorb and adapt to the increased cost of labor. While the mainstream literature does not provide enough evidence to clearly identify these strategies, we have been able to discern five adjustment mechanisms, or channels, based on research on the companies' strategies, coupled with studies in the areas of business and economics. The first mechanism is to reduce corporate profits. The second one is to either raise the prices of goods or services or reduce non-wage and production costs so that the firm's profits or earnings are not affected. A reduction in production costs would clearly have an impact on the quality of the products. The third mechanism is to reorganize the internal human resource structure of the



business. The fourth is to drop out of the formal labor market, either entirely or partially, and operate informally. Finally, with the fifth, and last, mechanism businesses can also choose to increase their investments in physical capital such as machinery and technology, update their processes, and automate them in some cases. Here investments are also sometimes made in human capital through training programs.

## 2. IMPACT OF THE MINIMUM WAGE ON UNEMPLOYMENT AND PRODUCTIVITY

Most of the studies that have been done on the minimum wage analyze the impact of increases in terms of their effect on unemployment. For businesses, the loss of human resources can have strong implications for productivity, since some of them have had to lay off productive workers in order to absorb the increase in the cost of manpower, resulting in a serious loss of resources and a disincentive to invest in training the workforce. The correlation between the minimum wage and unemployment has been studied extensively in the more advanced countries since the end of the 1940s. Recently, more studies have been published on developing countries. As noted earlier, despite extensive research on this subject, the findings on the effect of this policy on levels of employment and unemployment remain inconclusive in both industrialized and developing countries.<sup>2</sup>

Notwithstanding the lack of consensus on the effect of the minimum wage on unemployment and other variables, studies that have been done on the minimum wage and labor costs show us some lessons that may be relevant to emerging economies. One finding is that the effect of a minimum wage increase on unemployment depends on the size of the change. The impact on

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<sup>2</sup> There is still no theoretical consensus on the optimum correlation between the minimum wage and employment in a competitive versus a less competitive market. Empirically, the main challenges have to do with measuring the impact using existing information, how it should be measured (identification methods), and whether the results are comparable and applicable to different contexts. To begin with, it is difficult to measure competition in the labor market with precision. In addition to the degree of competition, other factors need to be taken into account, making it difficult to predict the precise effect on employment (underemployment, informal employment) and other variables. Examples of these other important factors include: the difference between the minimum wage and the market wage, the structure of the minimum wage (if it varies by sector or has multiple levels), degree of compliance (both current and before the increases), the percentage of workers whose skills are above or below the level to which the minimum wage applies, the size of the informal sector, and the flow between the formal and informal sectors (based on estimated elasticity).

unemployment increases in proportion to the amount of the raise. It also depends on the number of people affected by the minimum wage: the larger the numbers of workers who are earning close to the minimum wage, the greater the impact on unemployment.

#### a. Impact of the Minimum Wage on Employment and Unemployment

Much of the empirical literature<sup>3</sup> on developing countries shows that minimum wage increases have negative effects on employment (see, for example, Brown et al., 1982; Neumark and Wascher, 2000 and 2006; Machin et al., 2003 and 2004). However, there are also several studies that have questioned these findings and demonstrated that the policy's effects on employment can be nil and even positive in cases where businesses have some monopsonistic power over the labor market (for example, Katz and Krueger, 1992; Card and Krueger, 1994, 2000; Dube et al., 2007). The effect of the minimum wage on an economy will depend on the degree of compliance with the law and on the specific characteristics of the labor market in each country. In the case of industrialized countries, the literature indicates that there is usually an adverse effect on the demand for less qualified workers (Neumark, 2006), but the debate around the methodologies used in these studies and the conclusions derived from them continues.

In developing countries, which are typically characterized by high levels of informal employment, the implications of minimum wage policy differ substantially from what can be expected in developing economies, especially because the minimum wage in developing economies is more binding,<sup>4</sup> tends to be higher (defined as 20 to 60 percent above the average wage), and affects a larger number of workers (Maloney and Núñez Méndez, 2004).

As with the developed countries, the findings in the less developed countries in terms of the effects on unemployment and demand are inconclusive. One of the first studies on Latin America was conducted by Bell (1997) based on panel data from manufacturing firms in Mexico and Colombia. The results of this study indicated that during the period 1981-1987 the firms responded to increases in wage costs by reducing the number of their employees. In Colombia, increases in the minimum wage triggered significant industrial job losses in the country,

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<sup>3</sup> In interpreting most of the results cited in this review, it is important to keep the definition of elasticity in mind. In this document, employment elasticity as it refers to the minimum wage is the percentage change in the level of employment following a 10 percent increase in the minimum wage.

<sup>4</sup> *Vinculante* in Spanish [literally 'binding'], as it is used here, means that the distribution of earned wages tends to be close to the minimum wage.

estimated at between 2 and 12 percent of all jobs in the sector. In terms of elasticity, increases of 10 percent in the minimum wage reduced jobs for low-skilled workers by 1.5 percent to 3.3 percent and for more qualified workers by 0.3 percent to 2.4 percent.

In Mexico, the findings of the Bell study (1997) were inconclusive. It showed that when the real minimum wage fell by 45 percent there was no effect on employment in the manufacturing sector. This result reflected the minimal effectiveness of the minimum wage, which is set at quite low levels relative to the overall median wage. Furthermore, the businesses sampled were large companies that were offering high wages, typically higher than the minimum wage. In Chile, increases over the period 1996-2005 did result in greater unemployment, although actual job losses were less than 0.32 percent a year (Grau and Landerretche, 2011). During the Asian crisis, minimum wage increases that had been scheduled earlier, based on positive economic growth projections, continued to be implemented. However, when the crisis hit the Chilean economy, the increases were out of step with the reality that the country was facing (Marinakakis and Veloso, 2006).

More recently, Cunningham and Siga (2013) found that minimum wage increases in Brazil during 1996-2001 resulted in lost jobs, especially for workers on the lowest rungs of the pay ladder, whereas in Mexico there was no negative impact on total unemployment in 1988-1998. These conclusions were corroborated in a more recent study by Campos et al. (2015) and also in a report of the Government of the Federal District of Mexico (2014) which evaluated the effect of the 2012 minimum wage reform. Up until 2012 there had been three minimum wage zones, A, B, and C. Zone A had the highest minimum wage and Zone C, the lowest. In 2012, the Zone B minimum wage was increased to match Zone A. That increase translated into a 3.1 percent real minimum wage increase for Zone B. Therefore, the authors of the study looked at the impact of the 2012 move to a single minimum wage for Zones A and B. The outcome, derived using the Difference-in-Differences estimator, suggested that there was no negative effect on employment in Zone B, while the former Zone B workers received an immediate real increase in their wages of 2.9 percent.

The study by Maloney and Núñez Méndez (2004) also corroborated a negative correlation between employment and the minimum wage in Colombia. Based on panel data from household surveys, this study estimated that a 10 percent increase in the minimum wage during 1997-1999 reduced employment by 1.5 percent.

Studies on Brazil suggest that minimum wage increases have had a modest negative effect on employment (Fajnzylber, 2001; Neumark et al., 2006; Lemos, 2004a). For example, in terms of elasticity, Neumark et al. (2006) found an effect of about  $-0.07$  percent at the end of the 1990s, while Fajnzylber (2001) estimated an effect of between  $-0.08$  and  $-0.05$  percent in the 1980s and 1990s for workers who were earning close to the minimum wage. Lemos (2004a), in turn, found only  $-0.1$  percent elasticity for the economy as a whole and for certain vulnerable groups. One explanation for the minimal effects on employment is that businesses were able to adjust their

prices in response to the increase in labor costs (Lemos, 2004b). It was easier for them to raise prices during periods of inflation like the years used for this study (1982-2000).

Although in developing countries like Brazil the minimum wage policy applies to both the public and the private sector, there is evidence that the government does not respond to minimum wage increases to the same extent as the private sector. A study by Lemos (2007) based on monthly data from household surveys covering the period 1982-2000 shows that in the short term the minimum wage in Brazil did not have an adverse effect on employment overall or on the public or the private sector considered separately. However, jobs were lost in the private sector and gained in the public sector over the long term, suggesting an inelastic demand for labor. The increase in the public sector would largely offset the contraction in the private sector, with a net result that the minimum wage had very little effect on the overall economy.

The empirical literature on the developing countries has also looked at the adjustments that businesses have made depending on their size and cost structure. For example, Gindling and Terrell (2009) examined the effect of changes in the minimum wage on employment in Honduras based on panel data for the years 1990-2004. These authors estimated  $-0.46$  percent elasticity for large companies, while with small companies the minimum wage had a positive impact on employment, clearly reflecting the movement of workers who lost their jobs in the large companies to the smaller ones. As in Costa Rica, variations in the minimum wage had a greater effect on employees with less education who were working in smaller companies. An earlier study by El-Hamidi and Terrell (2001), based on employment information in Costa Rica for 1980-1992, showed that the minimum wage policy actually helped to create jobs in the country, mainly because of an increase in qualified employment. According to these authors, the industries that hired a highly qualified workforce were either facing a monopsonistic labor market or paying an efficiency wage that enabled them to increase their employment levels.

A more recent study by Alaniz et al. (2011) focused on the situation in Nicaragua, a country that has typically had high wages relative to the national average (a ratio of 0.53 for the mean minimum wage to the mean wage for 1998 and 2006 and a high median wage (a ratio of 0.81). Like several other Central American countries, Nicaragua has a system of multiple minimum wages for different sectors (14 sectors in all). The Alaniz study looked at variations in the minimum wage by state and by year to analyze the effects on employment. The authors used panel household data from 1998 through 2006 to show that increases in the sectoral minimum wage reduced the probability of being employed in the private sector. A 10 percent increase in the minimum wage reduced the probability of workers remaining employed in the private sector by 3.1 percentage points. However, this finding was only seen in large companies where there is greater compliance with minimum wage laws. The contraction in employment was the result of not only mass layoffs in the private sector, but also a reduction in the generation of new jobs in the private sector. In Peru, Céspedes (2005) also found evidence of adverse effects on employment for the period 1993-2003, with an elasticity of  $-0.13$  for the formal sector, which

means that a 10 percent increase in the minimum wage triggers a job loss of 1.3 percentage points.

In Asia, Indonesia is one of the main developing countries to be the subject of several studies on the implications of the minimum wage for the labor market. The minimum wage was introduced in Indonesia in the 1970s. Since then, the country has set multiple minimum wages, corresponding to each of the provinces (27 levels). In terms of the minimum wage relative to the average wage, Indonesia has one of the highest ratios of all the countries in Southeast Asia, at nearly 0.6 (Del Carpio, Pabon, 2014). The differences in the minimum wage level by province and the sharp rise in the minimum wage during the 1990s made it possible to analyze the potential effects of the minimum wage on the economy.

The results of these analyses are mixed. Based on panel data from the provinces, Rama (2001) found a negative effect for smaller businesses (with elasticities ranging from  $-0.77$  to  $-1.30$ ) and a positive effect in medium and large enterprises. The existence of monopsonistic power in the medium and large companies actually favored an increase in the demand for workers.

Alatas and Cameron (2008) studied the effect of a minimum wage increase in the area of Botabek between 1990 and 1996 (before the crisis) on the employment of workers engaged in the manufacture of textiles and footwear. The results showed a reduction in the employment of workers in small companies, with elasticities ranging from  $-0.31$  to  $-0.55$ , whereas in the large companies the effect was not even statistically significant. Some of the estimates actually showed increases in employment in the large enterprises, which would suggest that employment in the small companies was shifting to the large ones. Furthermore, the large companies appeared to be paying above the minimum wage, so that increases in the minimum wage would not affect employment levels. On the other hand, Harrison and Scorse (2010) found much more modest effects of the minimum wage increase on the textile industry in Indonesia during the 1990s. According to their estimates, a 10 percent increase in the minimum wage for workers in foreign enterprises and export firms in Indonesia would trigger a 1.2 to 1.8 percent reduction in employment, whereas in small companies the effect was insignificant, mainly because of low compliance with the law.

A more recent study on the situation in Indonesia with data from firms for the period 1996-2003 found moderate effects on employment, with job losses of less than 1 percent following a 10 percent increase in the minimum wage. Minimum wage hikes led to layoffs of less qualified workers, especially those in areas other than production and those in small companies (Del Carpio et al., 2013). This means that, prior to the minimum wage increases, the small companies, which usually engaged in labor-intensive activities and had little power over the market, were forced to lay off less-qualified workers to avoid bankruptcy. In Vietnam, it was found that during 2006-2010 the minimum wage had a negative effect on employment in domestic companies but none in the larger enterprises (Del Carpio, Nguyen, Nguyen and Wang, 2013).

In Thailand, a minimum wage was introduced in 1972 for Bangkok and the metropolitan area. Currently, the minimum wage in Thailand differs by province and by economic sector. The level of the minimum wage relative to the overall average wage is high, at a ratio of approximately 0.5 (Del Carpio and Pabon, 2014). Del Carpio et al. (2014) reported that changes in the regional minimum wage between 1998 and 2010 had negative repercussions on employment (with an elasticity of  $-0.05$ ) and the effect was disproportionately higher for workers who were the least productive (older workers between 50 and 60 years of age and workers with lower levels of education). In terms of hours worked, an increase was observed for male workers, suggesting that less productive workers more apt to lose their job were being replaced by working-age male workers.

For African countries, the literature on the effect of the minimum wage is relatively recent. Most of the analyses are based on the experience of South Africa, which has been gradually instituting a minimum wage policy since 1999 in specific sectors of the economy. For example, Borhat et al. (2013) studied the effect of introducing the minimum wage in five low-skilled job sectors: retail trade, domestic work, forestry, security, and transportation (taxi service), based on panel data from household surveys for the period 2000-2007. This analysis found that the minimum wage had no significant negative effect on employment in four of the sectors. The exception was public transportation, which included unionized taxi drivers. In fact, the retail trade, domestic work, and security sectors saw increases in employment following introduction of the minimum wage. However, these sectors also saw a reduction in the number of hours worked, which suggests that employers adapted by cutting back on their workers' schedules.

An adverse effect on employment has been seen in the agricultural sector (Bhorat, Kanbur and Stanwix, 2011). According to estimates by Borhat et al. (2011), the probability of finding a job in agriculture fell by 13 percentage points following the introduction of minimum wage legislation for this sector. On the other hand, there were no changes in the number of hours worked, suggesting that the only adjustment channel was laying off personnel and the schedule of those who remained employed was unaffected.

A more recent study by Garbers (2015), also on South Africa, supports the findings just mentioned for workers in agriculture. Based on panel data for 1997-2007, this study found job losses among the less qualified workers in the commercial agricultural sector. Landowners made various adjustments in response to higher labor costs resulting from introduction of the minimum wage and subsequent increases. While on the one hand there was an uptick in the demand for more qualified workers and those with more years of experience, on the other hand the owners of larger farms decided to intensify agricultural production by buying tractors and adopting other new technologies.

Dinkelman and Ranchhod (2012) studied the impact of introducing a minimum wage for domestic workers in South Africa in 2002. Using the Difference-in-Differences estimator, this

study presented evidence that the minimum wage had no short-term effect<sup>5</sup> on the probability of employment in this sector, on the number of hours worked, or on the proportion of full-time workers. In most cases, the wages of domestic workers were partially adjusted, but they remained below the legal minimum wage. Therefore, given the little effort made to inspect and oversee compliance with the law, it is possible that employers only made partial adjustments in the wages without affecting the demand for labor.

## **b. Impacts of the Minimum Wage on Vulnerable Groups**

Empirical evidence shows that the introduction of a minimum wage policy leads to a variety of outcomes not only depending on the context, but also for different groups of workers. As it was mentioned earlier, minimum wage policies are often used to protect the wages of the most vulnerable workers—for example, young and poorly qualified workers (usually the least productive), who earn close to the legal minimum wage. In less developed economies, women may also form part of this population group that is potentially vulnerable to increases in the cost of labor. The present section looks at some of the evidence on the impact of the minimum wage on vulnerable groups. Based on the authors' review, we can conclude that minimum wage policy does in fact have disproportionate effects on the most vulnerable groups of workers, and these effects are observable in both developed and developing economies.

Studies that analyze the effect of the minimum wage by gender arrive at various conclusions, but most of them find that the minimum wage disproportionately affects the employment of women. For example, in Brazil, Fajnzylber (2001) observed that the minimum wage had a moderate but negative effect on employment overall, but effect was even greater for women. In Thailand, Del Carpio et al. (2014) found a stronger negative impact on the employment of women and low-skilled workers.

Similarly, a study on Mexico by Feliciano (1998), based on data from the states for the period 1970-1990, found negative effects only on the employment of women and less qualified workers. The study showed that, although the minimum wage did not have an adverse effect on jobs for men, women saw reductions in employment of 5.2 percent to 11.1 percent following a 10 percent increase in the minimum wage. In addition, the study found evidence that less qualified workers were being replaced by ones who were more highly qualified. Thus, rises in the minimum wage led to increases in the employment of workers between the ages of 55 and 64, but the employment of younger workers was not affected. In Colombia, Arango and Pachón (2004) also saw negative effects on the employment of women. In Chile, on the other hand, Montenegro and Pagés (2004) found that the minimum wage led to an improvement in the employment of women between 1960 and 1998. Their findings would suggest that in some contexts it is possible that the minimum wage may encourage the participation of women in the workforce and improve their negotiating capacity.

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<sup>5</sup> Sixteen months after introduction of the minimum wage.

The Cunningham and Siga (2013) study on Mexico and Brazil mentioned earlier found that the minimum wage increase in Mexico mainly affected the employment of women and workers at the lowest wage levels. With a 1 percent increase in the minimum wage, women earning less than the minimum wage had a 0.08 percent greater probability of losing their jobs.

Although women in Mexico did receive wage increases, they were lower than the increases for men, especially for women earning the same or less than the minimum wage. In Brazil, the minimum wage increase also had a negative effect on the employment of women and young workers. The greatest job losses were seen in the vulnerable groups that were earning the least.

Similarly, Di Nardo et al. (1996), in their studies of the United States, were able to show that the minimum wage disproportionately affected women at the bottom of the pay scale. Their study found that the minimum wage law is applied more strictly for women and less for men. This uneven application of the minimum wage could account for the gender difference in the impact on employment. Addison et al. (2010), in their analysis of the effect of the minimum wage on employment and the participation of women in the workforce in 16 OECD member countries, found that the variations in the minimum wage level did in fact reduce the employment and participation of women. They also found that this impact is greater in countries where the minimum wage is higher relative to the average wage.

The literature on the effect of the minimum wage on wages for young workers is less consistent. Kristensen and Cunningham (2006), in their study of 19 countries in Latin America, found that in the countries where the wages of young workers, along with women and low-skilled workers, are most affected by minimum wage policies, the minimum wage is low relative to the average wage, perhaps because the minimum wage is closer to the wages received by vulnerable workers, thus affecting this group much more. Some businesses may pay the minimum wage to workers who have more skills and deserve the minimum wage, but if the minimum wage is high for the skills that the workers have to offer, the employers may choose to pay less than the minimum wage. In Mexico, Cunningham and Siga (2013) showed that older workers benefited more from a minimum wage increase than the youngest workers. This finding was valid for any wage bracket. In other words, young workers earned less following an increase in the minimum wage than older low-skilled workers.

In Brazil, older workers benefit more than young workers in some wage brackets, but not all. Within the group of low wage earners, when the minimum wage is increased 10 percent, young workers earn more (a 0.87 percent increase) than older workers (a 0.48 percent wage increase).

Within the group of low-skilled workers, there is the special case of young workers whose lack of experience and, in some cases, lack of skills as well, limits them to low-skilled occupations. A review of the literature by Brown (1999) noted that in the 1970s and 1980s young workers were losing jobs because of increases in the minimum wage, whereas more recent studies have shown



mixed results regarding the effect of the minimum wage on the employment of young workers. In Poland, the period 2005-2010 saw a relatively rapid rise in the minimum wage in parallel with a significant decline in the employment of 15 to 24 year-olds. The increase was so high that the ratio between the minimum wage and the average wage went from 0.34 to 0.41 in less than five years. Since the increase was uniform throughout the country, it was estimated that people in the poorest regions were most adversely affected (Majchrowska and Zołkiewski (2012). The negative impact on young workers was strongest in the less advanced regions and where the ratio between the minimum wage and the average wage was relatively high (Broniatowska et al., 2015).

For the United States between 1954 and 1979, Brown et al. (1982) noted that a 10 percent increase in the minimum wage generated a 1 to 3 percent reduction in the employment of young workers. Similarly, a more recent study by Neumark (2014) observed an overall reduction in employment following an increase in the minimum wage and young workers were affected the most. Studies on Brazil by Fajnzylber (2001) and Lemos (2004) also found greater job losses among young workers than for the workforce in general.

The evidence from some countries indicates that when faced with minimum wage increases, businesses tend to replace marginally productive low-skilled workers whose performance is below minimum wage level with more skilled workers. In Portugal, for example, Pereira (2003) analyzed the impact of a minimum wage equalization policy for young workers compared with the minimum wage level for workers over 19 years old. Based on panel data from a number of businesses, this study found that 10 percent increases in the minimum wage reduced employment for workers 18 and 19 years old by 2 and 4 percent, respectively, whereas they actually increased employment for workers 20 to 25 years old. This study also found a significant reduction in hours worked or cutbacks from full to half-time work. Faced with an imminent increase in labor costs, businesses replaced less skilled workers (18 and 19 year-olds) with workers who were more skilled (20 to 25 year-olds). In Chile, Montenegro and Pagés (2004) found that the minimum wage had a negative effect on the employment of young low-skilled workers over the period 1960-1998.

Recent studies on Costa Rica and Honduras by Gindling and Terrell (2005, 2009) found that the minimum wage had similar adverse effects for less skilled workers. Based on information from household surveys over the period 1988-2000, Gindling and Terrell (2005) found that a 10 percent increase in the minimum wage generated a 1.09 percent contraction in employment and 0.6 percent reduction in the number of hours worked. The study also examined the effects at different points in the range of skills, finding that the minimum wage disproportionately affected workers in the middle and lower range (from the second to the fifth decile). Overall, the evidence for Costa Rica suggests that businesses adapt to increases in the minimum wage by replacing less skilled workers with those who are more skilled.

### 3. IMPACTS OF THE MINIMUM WAGE ON INFORMAL EMPLOYMENT AND PRODUCTIVITY

In developing economies characterized by a high proportion of informality in the labor market, the minimum wage plays an important role for this segment of workers as well as in the dynamics between the formal and informal sectors. Theoretically, in a context of duality in which one sector is regulated by law and the other is not, increases in the minimum wage are expected to lead to more employment in the informal sector. Therefore, when faced with labor cost increases in excess of the value of labor productivity, businesses in the formal sector have to downsize their workforce, especially their less productive workers. When this happens, the workers who lose their jobs in formal businesses are forced to find employment in the informal sector of the economy—unless they choose to remain unemployed or inactive while waiting for better opportunities. Businesses may also stop paying social benefits for workers. As a result of these measures, a large percentage of their employees can end up working without paid social benefits. One of the consequences of resorting to informal contractual arrangements is that employers have less incentive to invest in training, since there is no guarantee that the workers will stay and the cost could be wasted. This situation can jeopardize productivity in both individual companies and the sector in general.

Some of the empirical evidence on the relationship between the minimum wage and informal employment belies the predictions of the dual model, as we will see below. In the end, the conclusion derived from this analysis is that in countries where this phenomenon has been extensively studied the evidence is controversial.

In Brazil, Fajnzylber (2001) has suggested that minimum wage increases have a much more severe effect on employment in the informal sector than in the formal sector. A 10 percent increase in the minimum wage shrinks employment in the formal sector by 1 percent, but the contraction ranges between 2.5 and 3.5 percent in the informal sector. Thus it can be assumed that during 1982-1997 the minimum wage policy reduced the number of informal workers, either because they found a better-paid job in the formal sector or because they dropped out of the labor market entirely. It is also possible that workers who decided to leave the market may have done so because other household members obtained jobs that paid better.

Based on household survey data for 1982-2000, Lemos (2004) found that the minimum wage had a long-term adverse effect on employment in both sectors and that the contraction in employment was consistent with wage increases for both formal and informal workers. Although the impact was greater in the informal sector, in both cases the elasticities were lower than 1 percent. On the other hand, Carneiro (2001) found that minimum wage increases during 1982-1999 reduced formal employment, with elasticities ranging between  $-0.001$  and  $-0.024$ , and increased informal employment, which is more consistent with the predictions of the dual model.

A study by Terrell (2009) covering a more recent period (2002-2008) in Costa Rica looked at the

effect of increases in the minimum wage and greater compliance with legislation on the employment of men in the formal sector. The results of this study again support the hypothesis that a higher minimum wage contributes to the growth of informal employment. Thus, minimum wage increases make it more probable that a formal worker will end up working in the informal sector or being self-employed. It was also found that the minimum wage, while reducing the chances of unemployment and inactivity, also discouraged the hiring of new employees.

In Indonesia, Bird and Manning (2002)<sup>6</sup> estimated the impact of the minimum wage on the formal and informal employment of workers in the urban sector over the period 1990-2000. Based on panel data from the provinces, this analysis concluded that the informal sector grew during the period, mainly due to the displacement of workers from the modern sector of the economy and the contraction of formal employment following increases in the minimum wage. These results for Indonesia were corroborated by Comola and de Mello (2011) in a recent study of individual workers covering the period 1996-2004, but these authors also found that the increases in informal employment more than offset the losses in formal employment, resulting in a net positive effect.

These findings notwithstanding, a recent study on Indonesia by Magruder (2013) indicated that in economies with high labor productivity where the minimum wage is set on the basis of local conditions, introduction of this policy can stimulate an economy's development—an outcome known in the economic literature as the *big push effect*. Based on panel data for the 1990s, Magruder (2013) showed that increases in the minimum wage at the district (kabupaten) level generated greater local demand (measured in terms of expenditure), which led in turn to a greater demand for labor. Such results would be consistent with the expansion of formal employment and contraction of informal employment. However, these trends are only observed in non-tradable sectors of the economy.

Recent evidence in Nicaragua corroborates the predictions of the dual labor market model (Alaniz et al., 2011). During the period 1998-2006, increases in the minimum wage were followed by reduced employment in the private sector. At the same time, there was an increased probability that workers in the private sector who were affected by the minimum wage would drop out of the labor market and find jobs in the public sector or spend more time on unpaid family activities. In the case of Honduras, Gindling, and Terrell (2009) found indications that smaller businesses, which tend to be less strict about compliance with minimum wage laws, absorbed many of the workers who were previously employed by large and medium-sized firms and lost their jobs because of the new labor costs triggered by increases in the minimum wage. A 10 percent increase in the minimum wage corresponded to a 3.9 percent rise in employment in the latter sector. Although the study did not provide disaggregated information by groups, it is assumed that the workers who lost their jobs were either less productive (young workers, women, low-skilled workers) or working in less productive industries.

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<sup>6</sup> See Comolla et al. (2011).

In Costa Rica, the results also differed from the predictions of a competitive dual model. El-Hamidi and Terrell (2001) claimed that between 1980 and 1992, the minimum wage in Costa Rica helped to generate formal employment, which is consistent with the presence of a monopsonistic power in that market, but did not lead to any significant change in informal employment. Also, a Terrell (2009) study on Costa Rica concluded that the minimum wage had a negative effect on informal employment. Part of this difference might be due to the fact that two different time periods were being analyzed.

In Mexico, the report prepared for the Government of the Federal District (2014) showed that in the short term the minimum wage increase that brought the wage in Zone B up to the level of Zone A reduced the probability of transitioning from the formal to the informal sector by 2.8 percent, compared with zones A and C. The use of Zone A as a control group ensured that no effects from any other type of initiative might be influencing the increase in informal employment. According to the authors, for workers who entered the labor market following the increase in Zone B (in other words, unemployed people who found jobs after the reform), the probability of entering the informal sector was reduced by 5.1 percent, while that of entering the formal sector rose by 3.8 percent. Campos et al. (2015) looked at the same reform<sup>7</sup> and calculated that the impact was even greater. These authors indicated that the probability of moving from the informal to the formal sector increased by 5.3 percentage points. They also found a substantial reduction in informal employment (9 percentage points).

In South Africa, Garbers (2015) examined the effect of a minimum wage for the agriculture sector on workers engaged in subsistence farming. Generally speaking, the net effect of the introduction of a minimum wage on the formal sector of commercial agriculture was negative and mainly affected low-skilled workers. The study suggested that some of the workers laid off in the commercial agricultural sector were absorbed by subsistence farming and other informal industries in the economy.

#### 4. ADJUSTMENT CHANNELS FOR BUSINESSES

The evidence has shown that in some cases increased labor costs such as the minimum wage have had neither a negative nor a positive effect on businesses, while in other cases they have had a direct negative effect on profits. These differences are due to a number of factors, including the size and frequency of the changes, how much they affect wage distribution (ripple effect) within a business (Wicks-Lim, 2006), and the firm's capacity to adapt to the change. This section explores various mechanisms that businesses use to adjust to increased labor costs. It also looks

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<sup>7</sup> While there are differences in the results presented in the government report and the study by Campos et al., it is likely that these differences are due to the use of different quarters in the database.

at correlations between the various adjustment strategies and the impacts observed in the extensive literature on the subject.

A theoretical paper by Basu et al. (2010) has suggested that the impact depends on the structure of the labor market and the degree of compliance with the law. Another factor, not considered by the authors of this theory, is the adjustment mechanisms or channels available to businesses for adapting to the increases. Without this information, it is difficult to predict the full impact either on the business itself or at the sectoral level. Several different channels for adjusting to increased labor costs have been identified in the literature. Some of them are applied mainly in the short term, while others may be implemented over the medium or long term. Sometimes businesses use a combination of strategies that enable them to react to increased costs in the short term and at the same time prepare for future increases through the implementation of structural changes to control costs on a more sustainable basis.

Apart from closing down a business completely or liquidating its assets, the following channels have been identified in the literature: (a) absorbing the cost increases and accepting lower profits; (b) sharing the costs with clients (or providers) through price changes, reductions in the quality of services or products, or cutbacks in non-wage costs; (c) implementing changes in the company's internal human resources structure such as layoffs, changes in working hours, outsourcing of certain tasks or subcontracting services, replacement of low-skilled workers for those with more training, or elimination of permanent jobs and hiring of temporary workers with fewer benefits; (d) eliminating formal employment entirely (or partially) and operating informally; (e) investing in machines and equipment to streamline the production or service delivery processes, thus reducing the need for human resources, or investing in training to improve the company's productivity.

Empirical literature on developing economies at the level of individual businesses is sparse, especially on the adjustment channels they have used when faced with higher labor costs as a result of increases in the minimum wage. It is hoped that the following review will not only help set the stage for the analytical work to be done during the second phase of this project but also motivate others—both academics and experts—to explore ways in which businesses in emerging economies might be able to adjust to substantial increases in the minimum wage and other labor costs. It is most important to understand the different types of adjustment that can be enlisted, depending on the sector, the region, and the size of the firm, so that governments in emerging economies can prepare for this type of contingency and assist businesses at risk to choose the best adjustment channels in the circumstances.

#### **a. First Adjustment Channel: Absorbing Costs and Accepting Lower Profits**

Use of this channel is viable when the sector (and the particular business) has a high profit margin—for example, in cases where the labor market is not very competitive (monopsonistic markets), or where the market for products is not very competitive (oligopolistic markets). Use

of this strategy tends to be less viable in human capital-intensive sectors where businesses compete globally (e.g., textiles, agriculture, agribusiness). In some cases, companies may choose to absorb labor costs because they expect to save money through employee attrition (normal turnover), which would spare them the cost of selecting and training personnel. Jacobs and Graham-Squire (2010) have estimated that about 18 percent of increased wage costs faced by companies that provide school lunch services are absorbed by retaining their personnel. In fact, some companies pay more than the minimum (or market) wage as a competitive strategy. These firms are not only trying to control spending on personnel recruitment and training; they are also looking for ways to reduce the cost of worker absences, motivate employees, and encourage productivity. This strategy is referred to as an efficiency wage. Since this approach is only tangentially related to the adjustment channel being examined, it will not be discussed here in detail (for further information, see separate note on the efficiency wage).

In Costa Rica, the 2010 national minimum wage campaign resulted in improved compliance with the law. This greater compliance, in turn, led to a 10 percent wage increase for persons who were earning less than the minimum wage prior to the campaign, but there were no changes in the wages of those earning the minimum wage or more. The authors did not find any negative effect on employment (Gindling et al., 2015). They argued that the businesses had been keeping wages artificially low for a subgroup of their workers, but with the campaign for compliance the risk of being discovered by the authorities led them to change, without having to make other adjustments. The exception, perhaps, would be profits, as seen in the United Kingdom with the introduction of the minimum wage, which in effect led to a reduction in returns for businesses (Draca et al., 2011).

According to Draca et al. (2011), the industries most negatively affected in terms of loss of profits were those with greatest market power (and less competition), the oligopolies. The authors used the Lerner Index to differentiate between firms that were operating in more competitive markets versus those in less competitive markets. The companies in both markets were facing similar wage increases, but for those in the non-competitive markets the reduction in profits was two and a half times greater than for those in competitive markets. This was a short-term outcome. The explanation of the results—demonstrated using a theoretical model and an empirical application for the sector of homes for older adults and the disabled in the United Kingdom—is that in the competitive markets, when all the businesses shared the same increases in their marginal costs, they were able to pass on those costs to consumers through price increases (the second strategy), whereas in the less competitive markets, companies adapted by reducing their profits instead of their prices. In Indonesia, a campaign similar to the one in Costa Rica, but focused on the clothing and footwear sector, also resulted in wage increases through greater compliance with the minimum wage law. The study's authors found that the businesses were unable to absorb the increased labor costs and had to reduce their profits, and in some cases they had to close their factories (Harrison and Scorse, 2010).

## b. Second Adjustment Channel: Raising Prices, Reducing Non-Wage Costs, and Lowering Quality

Use of the second adjustment channel depends on the company's ability to pass on the costs to clients in the form of price increases, reduce non-wage costs, or lower the quality of their products and/or services. Passing on the cost to consumers is feasible if the demand for the products and/or services is relatively inelastic and if the market is perfectly competitive. Little evidence has been gathered on the application and implications of this mechanism. However, a review of the literature by Lemos (2008) has noted several studies that measured the effect on prices using several different methods. This strategy is seen in competitive markets where the entire sector is affected by an increase in input (labor) costs and where it is possible to increase prices without the risk of losing business to the competition.

With regard to the price strategy, the evidence from studies on changes in the minimum wage shows that the most common response to an increase in the minimum wage is to raise prices, and this is why it has not had much of an effect on unemployment (Converse et al., 1981, cited in Lemos, 2008). Price adjustments are seen most often in the hotel, restaurant, construction, and retail trade sectors, where the profit margins are low (MaCurdy, 2015). For example, prices in San Francisco restaurants went up 2.8 percent as a result of a 26 percent increase in the minimum wage (Dube, Naidu, and Reich, 2007). Restaurants in the United States and Canada raised their prices 0.7 percent in response to a 10 percent increase in the minimum wage, and most of the adjustments occurred during the period two months before and after the increase was made official (Aaronson, 2001). Pass-through pricing by restaurants in the state of Georgia in the United States was estimated to offset two-thirds of their total cost increases (Hirsch, Kaufman, and Zelenska, 2011). In the United Kingdom, Wadsworth (2007) found that prices in the commercial and service sectors rose by an average of 0.8 percent following introduction of the minimum wage in 1999. Prices for cleaning services went up 2.2 percent, while those for beauty services (hairdressing) rose only 0.1 percent.

This strategy is related to effects on inflation. The evidence, using partial and general equilibrium models (various empirical methods), shows that when the minimum wage goes up, prices usually go up as well, even though the effects may be quite small (Sellekaerts, 1981; Cox and Oaxaca, 1981).<sup>8</sup> Sellekaerts noted that a 10 percent increase in the minimum wage in the United States in the 1970s resulted in 0.2 percent increase in inflation. In 2015, MaCurdy reported on an

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<sup>8</sup> Many inflation control tactics used by poor countries throughout the world, are based on a strong tie-in between the labor market and inflation. This basis is derived in part from the inverse relationship between inflation (nominal wages) and employment shown in the much-cited Phillips curve. The principles behind the Phillips curve and its extensions have provided the bases for several analytical studies on the subject. Still, the relationship to wages has been questioned because the Phillips curve does not consider changes in productivity or reserve wages, which are taken into account in the wage curve. However, apart from such concerns, these studies continue to be seminal contributions toward understanding the macroeconomic effects of the minimum wage.

equilibrium model that measured the costs and benefits of increases in the minimum wage based on how they were reflected in rising prices. This study concluded that households in the highest quintiles paid 31.7 percent of the costs associated with a 21 percent rise in the federal minimum wage in 1996, while households in the poorest quintiles paid 9.3 percent. Unfortunately, however, if the percentage of total consumption of basic products is taken into account, the higher prices faced by the poorest households completely cancel out their earnings from the wage increase. This calculation shows how regressive a minimum wage policy can be. Even though general equilibrium methods involve assumptions that make it difficult to arrive at precise estimates, these studies continue to be useful for understanding the mechanisms of pricing pass-through to consumers and the potential inflationary effect because they measure the impact on the entire economy. Partial equilibrium models are unable to do this. Furthermore, the majority of studies (especially those done on the United States) have arrived at similar results—namely, between 0.02 and 0.4 percent (cited in Lemos: Gramlich, 1976; Falconer, 1978; and Gordon, 1981).

In Brazil, where several empirical studies have examined the impact on prices, it has been found that businesses do in fact make their adjustments through pricing (Lemos 2004, 2006). Thus, a 10 percent increase in the minimum wage leads to a change of at least 0.8 percent in the level of prices. The effects are different for the rich and the poor, being much higher for the poor (about 0.12 percent) and much lower for the rich (about 0.04 percent). The effects on prices change over time, peaking at 0.27 and 0.16 percent for the poor and the rich, respectively, at around the sixth month after the change in the minimum wage. When indirect (spillover) wages are included, as well as price changes made in anticipation, the effects have been even higher—namely, between 1.3 and 3.5 percent. In the case of Costa Rica, Gindling and Lemos (2006) showed that the effects on prices are low, similar to those seen in the United States. The authors attribute this finding to two main factors: the labor market structure and the economic context, since these factors influence how the businesses choose to adjust. Limited access to information has made it more challenging to discern the effects.

In 15 European countries, approximately 65 percent of the businesses (from a database of 15,000 companies that employ five or more workers) report that when they are faced with increases in the minimum wage they use a combined strategy and adjust both prices and costs at the same time. Of all the companies, 14 percent adjust prices, 11 percent only reduce costs, and the rest use other strategies. The firms report that a flexible wage policy gives them the opportunity to use other strategies besides price adjustment. Otherwise, when wages rise based on collective bargaining agreements, making the wages less flexible, businesses are forced to adjust through prices and costs (Dhyne and Durant, 2010). When the percentage of labor costs is high, the price adjustment is the more likely choice. When prices and wages are more closely linked, the percentage of the costs is more biased toward labor costs (Durant et al., 2009) and profit margins are smaller.

The evidence shows that when businesses make adjustments in their costs, they may also make



changes in their employment structure (see the third strategy) and non-wage costs. For example, in some cases they trim benefits not required under the labor laws, reduce health and other insurance, and/or reduce investments in training. Examples of this strategy include changes in health and pension plans toward less generous arrangements, elimination of bonuses or benefits related to travel and meals, and irregular shifts. In the United States, studies show that in some cases there have been cutbacks in training (Neumark and Wascher, 2001), whereas in other cases there has been no statistically significant effect on the provision of training (Acemoglu and Pischke, 1999).

The effect of adjustments that involve reducing expenditure on health insurance and pensions will vary depending on the size of the increase: an increase of 50 cents (15 percent) was shown to have a positive effect, but when the increase was higher, health benefits and pensions were cut (Royalty, 2000). Simon and Kaestner (2003) did not see additional benefits reduced, especially in companies that had a variety of worker profiles (high-, medium-, and low-skilled), because (with a few exceptions) the employers were required by law to offer differentiated benefits. On the other hand, Bucila (2008) found in a particular treatment group that minimum wage increases reduced the probability of having employment-related health insurance by as much as 4 percentage points. The results for small companies are clear. With larger firms, the author speculates that they are able to make cost-saving adjustments such as requiring a higher copayment from employees. As for health and other insurance benefits, since they apply to all workers in the company, cutbacks affect all employees, even if the minimum wage does not apply to them. Simon and Kaestner (2003) argue that it is more common to adopt the strategy of reducing non-wage benefits in businesses where most of the workers are low-skilled and are earning close to the minimum wage.

### **c. Third Adjustment Channel: Restructuring Human Resources**

The third adjustment channel is modifying the company's internal human resources structure. This channel refers not only to downsizing but also to the replacement of low-skilled and less qualified workers with people who have more skills and qualifications, replacement of permanent workers with temporary workers, and outsourcing or the use of third parties to provide services. One of the implications of the use of this relatively new adjustment strategy is that the labor unit cost improves because businesses can keep their labor costs relatively stable through outsourcing (Dustmann et al., 2014). This type of change in the labor market structure is not considered in empirical studies, since they cannot rely on the company's own data, which means that in this case it is impossible to measure the true effects of a minimum wage increase on employment.

We will start with the most widely studied change: downsizing. The literature includes a number of examples in which low-skilled workers, whose productivity may be below the wage level indicated by the labor laws, are negatively affected because they lose their jobs (Brown et al., 1982; Neumark and Wascher, 2000, 2006). There is much evidence that businesses do not resort

to this strategy without trying other adjustment channels first. Some businesses, such as those in the restaurant, retail trade, and service sectors, tend to avoid laying off workers and therefore do not see reductions in employment levels (Katz and Krueger, 1992; Card and Krueger, 1994, Borat et al 2013).

Structural changes in the composition of human resources include the replacement of low-skilled workers with others who are more highly skilled and more productive and/or with workers who can operate more sophisticated machinery or equipment. The example of Portugal cited earlier shows that the businesses were not prepared to subsidize the skills deficit of young people aged 18 and 19 and preferred to replace them with older workers (20 to 25 years old) who had better skills and/or more experience. Before the minimum wage was made the same for both groups, the wage difference between them compensated to some extent for the lesser experience of the younger group, but making their wage the same eliminated the cost advantage of hiring very young workers (Pereira, 2003).

The literature shows that the typical profile of the worker who loses his or her job in the formal sector of the economy is similar throughout the world: young, low-skilled, with limited experience. In countries where labor costs are relatively low, it is possible to maintain a fringe of workers who are not directly involved in the products and only play a facilitating role. But when costs rise, businesses are forced to lay off nonessential personnel in the production or service areas. This effect was seen in Indonesia, where most of the personnel laid off were in security or cleaning, assisted with production, or ran errands (Del Carpio et al., 2014).

There are studies in the business literature showing that in some cases these functions do not disappear; instead, workers are hired under third-party contracts—in other words, the work is outsourced (Dube and Kaplan, 2010). Outsourcing has grown rapidly throughout the world, partly because advances in technology make it possible to enlist this type of employment as a strategy for controlling labor costs (Autor, 2003; Acemoglu and Autor, 2011). Many businesses prefer to hire essential personnel and subcontract support services such as logistics, cleaning, security, food service, and information technology services, among others. In Germany, the growth of outsourcing over the last two decades has led to a notable increase in income inequality. Compared with workers performing the same tasks in a conventional firm, outsourced workers were found to be earning 10 percent less five years after changing their employment status. The main reasons cited for the rapid adoption of this phenomenon were the reduction of the cost of labor inputs and the flexibility to be able to make personnel changes in the future (Goldschmidt and Schmieder, 2014).

Another change is the practice of hiring workers under flexible (e.g., temporary) contracts that do not require the payment of full benefits. Companies are changing their hiring strategy and employing fewer permanent workers and more workers under contracts that are less binding. In Poland, the proportion of workers hired under temporary contracts is about 27 percent. Contracts of this kind are especially common in the private sector and in industry, particularly in

administrative occupations and support services (Arak et al., 2014). There are also examples of companies that pay above the minimum wage and offer more, not fewer, benefits in order to compete on the market. An article in the *Harvard Business Review* (Cascio, 2006) reported that the Costco warehouse chain pays its workers efficiency wages<sup>9</sup> and offers them other benefits (health insurance and pension contributions) as a competitive business strategy. The main reasons the company cited for its policy are to foster loyalty and reduce turnover costs—i.e., the costs of selecting and training personnel—and give employees the incentive to make an extra effort and be more productive.

In most businesses, especially those that compete globally and offer products and services with low profit margins, there is pressure to control or reduce labor costs. In fact, the rigidity of labor policies is prompting businesses in the formal sector to look for external providers, and in many cases these providers are in the informal sector of the economy. Moreno-Monroy et al. (2014), among other authors, have presented evidence on India showing that the growth of the modern (as opposed to the traditional) informal sector is owed to the fact that formal businesses are seeking out their services. Labor policies tend to strengthen the ties between formal businesses and the informal sector as they become increasingly complementary (Sundaram, Ahsan, and Mitra, 2012). There are also other negative effects that are rarely taken into account in analyzing the effects of labor costs. Anner (2011) showed that as large domestic and foreign companies face increasing pressure to cut costs, they resort more and more to subcontracting the services of small companies that keep their prices down because they are in close competition with one another. As a result, there has been a decline in the quality of employment for certain segments of the population that are less subject to the constraints of labor laws.

In the short term, it is rather common to reduce the schedule of employees when the minimum wage is calculated on a monthly or daily, rather than an hourly, basis: workers are either tasked with more work to perform on the same schedule or required to work more hours in a day. In Latin America, many countries establish a daily or monthly minimum wage, which can result in this type of abuse. In Turkey, where the minimum wage is established on a monthly basis, the number of hours worked has been shown to rise in tandem with the level of the minimum wage (World Bank, 2015). On the other hand, when the minimum wage is an hourly figure, the number of hours tends to be reduced. In Chile, businesses chose to lay off workers rather than cut their hours during the years under study (Grau and Landeretche, 2011). In Europe, one of the most common adjustments to changes in labor costs when businesses have a high percentage of low-skilled workers is to reduce their hours (Dhyne and Durant, 2010). The use of this strategy is more evident in small companies where there is less margin for laying off workers; if the minimum wage increase is very high, small companies (with fewer options) may even disappear. In the United Kingdom, about one-tenth of the workers who came under the new minimum wage régime in 1999 saw reductions in the working hours, although the cuts were minor (Stewart and

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<sup>9</sup> See note on the efficiency wage.

Swaffield, 2002). Bhorat et al. (2013) found that in South Africa employers also adjusted to the rise in costs by cutting back on workers' hours.

#### d. Fourth Adjustment Channel: Leaving the Formal Sector, Partially or Entirely

The fourth strategy is to get out of the formal sector, either partially or entirely, and operate on an informal basis with employees who are not protected by labor legislation. This strategy is quite common in developing countries, where informal employment is especially prevalent in sectors that are more human capital-intensive and productivity is low. In Latin America, it has been found that labor rigidity, coupled with little oversight of the businesses could lead some of them to operate illegally to avoid having to pay the required social benefits and taxes (Loayza, Oviedo, and Servan, 2005). Businesses that operate partially on an informal basis can decide which employees to assign to formal positions. In theory, businesses would choose to pay social benefits to their most productive workers, whose marginal productivity compensates for the additional cost (Bosch, 2006). There is little empirical evidence on decisions made by businesses to hire personnel under formal or informal arrangements. Most of the predictions are based on theoretical models (for example, Bosch, 2006). However, country-level studies based on panel data have shown that increased labor costs tend to increase the size of the informal sector (for example, Loayza et al., 2005; Hazans, 2011; Fialová and Schneider, 2011; and Lehmann and Muravyev, 2012).

A study by Hazans (2011) based on 30 European countries over the period 2004-2009 found that rises of 1 percentage point in the minimum wage increased informal employment by about 0.3 percentage points. Similarly, Fialová and Schneider (2011), studying panel data for 2000-2007, concluded that the work of labor institutions helped to promote the growth of the informal sector in Europe. The authors found that the strictest labor regulations on worker protection (as measured by the OECD Employment Protection Legislation Index) had a significant effect on the growth of informal employment in the European economies. A more recent study of a sample of European and Latin American countries found that stricter regulations and higher payroll taxes are the main determinants of informal employment in emerging economies in Europe and Latin America (Lehmann and Muravyev, 2012). For example, a 10 percent increase in the Employment Protection Legislation Index would correspond to a 13 percent increase in informal employment, while a 10 percent increase in the payroll tax would increase informal employment by 1.3 percent.

Overall, a number of studies suggest that introducing or increasing the level of the minimum wage in the economy increases informal employment for two reasons: primarily because businesses, when faced with labor costs, choose to avoid paying social benefits for some of their workers, and also because they have to lay off workers and much of this manpower is absorbed by low-productivity enterprises that operate in the informal sector. Evidence of this type of relationship between the minimum wage and the informal sector has been seen especially in Brazil, Honduras, Nicaragua, and Indonesia. In Brazil, for example, Carneiro (2001) was able to demonstrate that rises in the minimum wage over the period 1982-1999 reduced formal

employment and increased informal employment. In Honduras, Gindling and Terrell (2009) observed that smaller companies, which usually operate illegally, ended up absorbing the bulk of the workforce that had been laid off following increases in the minimum wage. Bird and Manning (2002), in their work on Indonesia, concluded that the informal sector grew between 1990 and 2000 mainly because of displaced workers coming from the modern sector of the economy and a reduction in the creation of formal jobs as a result of the minimum wage increase during that decade.

#### **e. Fifth Adjustment Channel: Upgrading Physical Capital, Technology, Processes, and Human Capital**

This channel is perhaps the most interesting one, since it has not been extensively studied, even though it is quite common. It refers to adjustments through changes in investments in physical capital, such as machinery, equipment, operating systems, technological solutions, and other options that replace people with technology. Hamermesh (2014) found that increased labor costs make the use of physical capital more attractive. The author argues that as labor costs continue to rise and technology improves, the latter becomes more accessible and this option becomes more viable. In a recent article, Karabarbounis and Neiman (2014) note that since the 1980s the share of national income in the industrialized countries represented by income from labor has declined, and this trend has largely followed a reduction in the cost of information technology, which has enabled some businesses to replace workers with technology, equipment, and machinery. This strategy has included improvements in the internal management and processes of companies, and these changes, in turn, have led to structural changes with medium- and long-term effects. The idea is that replacing manpower with capital will make for better use of the capital, which should have a positive impact on productivity. Businesses can also improve the quality of their physical capital by enhancing their use of what they already have through changes in the management of their processes or investments in training their human capital.

Alessina et al. (2015) argue that the costs imposed by labor policies can lead to the adoption of technologies that will make for savings in labor costs. Investments in machinery and technology can help to improve a company's efficiency in the medium and long term. The most well-known case is the Green Revolution, in which the adoption of technology led to improvements in processes and productivity in the agricultural sector and a reduction in labor intensity (Murgai et al., 2001). Garbers (2015) found that landowners in the agricultural sector responded to high labor costs by intensifying their agricultural production with the adoption of new technologies such as tractors and replacing their low-skilled workers with personnel who could handle the new equipment.

The emerging literature on the capital-labor ratio shows that in many cases technology complements manpower instead of replacing workers. To put it another way, technology does not promote overall unemployment, but it does promote unemployment in the less-skilled segments of the population whose work can be easily automated (Autor, 2014). In the

construction sector, for example, the introduction of machinery replaced workers whose skills focused on carrying materials or other easily automated tasks, but it increased jobs for machine operators, leading to an overall change in the sector's profile. Apart from the loss of jobs in the lowest range of skills, the literature shows that many of the improvements in technology also have a negative effect on jobs in the low-to-medium range (and less at the lowest end), where labor costs warrant investments in mechanization. These are usually formal jobs, and therefore the affected workers are forced to accept lower-skilled jobs in manual occupations (probably temporary or informal jobs), which leads to polarization<sup>10</sup> of the labor market (Goos and Manning, 2007).

In New Zealand, businesses with a high percentage of young employees were forced to replace their workers in response to wage increases between 2000 and 2007. The survival rate for these companies was lower than for new firms with the same percentage of young employees. One explanation that the authors propose is that the new companies (and those that survived) were able to adapt their technology. The wage increase was sufficiently high to trigger investments in productive technologies that could be used by young (and less-skilled) workers by the new and surviving companies (Hyslop et al., 2012). In the largest fast food chain in the United States, most of the tasks are routine and can readily be automated. Therefore, this chain seeks to control labor costs by replacing people with technology. An example is the replacement of cashiers with automated point-of-sale devices. It also uses automated machinery that can cook more than 300 hamburgers in an hour, thus eliminating countless jobs in this category (Sherk, 2014).

However, not all sectors can replace people with technology in the short or medium term, either because the sector requires technology that does not exist or is not sufficiently advanced to justify the change, or because the cost of purchasing it is very high or the business does not have sufficient liquidity to make the change. In many cases this strategy ends up being implemented in the medium term, rather than the short term, which leads authors to underestimate the impact of increases in the minimum wage (and labor costs overall) and fail to identify the strategy as a form of adjustment. In fact, Neumark and Wascher (2006) point out that the positive effects on employment are usually found in studies that use panel data over a short period of time and suggest that their results might have been different if they had used data over a longer period. Hirsch, Kaufman, and Zelenska (2011) showed that businesses in the fast food sector in Georgia adjusted to the changes by making improvements in operational efficiency. About 23 percent of the cost increase was offset by improvements in processing standards, including more precise monitoring of personnel attendance and hours worked, higher expectations for quick performance, assignment of additional tasks, and prompt dismissal of those who did not

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<sup>10</sup> The authors point out that technology tends to "hollow out the middle" of the labor market, since it helps to replace routine cognitive occupations (jobs in the middle of the wage spectrum) while at the same time complementing occupations at the high end of the spectrum.

improve. Savings were also reported on inputs such as water and electricity, and efforts were made to reduce waste in food and supplies.

In case studies of four companies in four countries (Ton, 2014) that employed low- and medium-skilled workers and were competing in retail trade and services, their strategy for remaining competitive focused on improved management of inputs—human resources, material objects, technology, and processes—rather than attempting to control costs, especially the cost of wages, reactively. The four businesses had designed their operations to limit the number of products and/or services they offered; they had managed to combine standardization with empowerment; they were constantly training their employees; and customer service was a high priority. The author’s main point is that when these companies have invested in the quality of their labor force and the improvement of their processes, paying efficiency wages guarantees a positive return on their money and minimizes the need to control the costs incurred as a result of the minimum wage.

## 5. LESSONS ON THE EFFECTS OF THE MINIMUM WAGE FROM THE INTERNATIONAL LITERATURE

Recent years have seen stepped-up use of minimum wage policy in most countries of the world. Even though the volume of empirical evidence for developing countries has been growing, there is still no consensus on the effect of institutionalizing a minimum wage and/or increasing it on the level of unemployment, the demand for labor, or the prevalence of informal employment. Furthermore, it is difficult to discern patterns in the available results based on the existing evidence because the effect of the minimum wage will differ depending on the situation in each individual country, the institutional design of the policy, the level of the wage relative to the average wage, the extent to which the labor legislation is binding and the degree of compliance, and other factors. Evidence on the effects of the minimum wage in emerging economies continues to grow but is still not very extensive; but among the studies that do exist the effects found differ broadly, even when looking at the same country. Although the minimum wage policy could have some adverse effects on the quality of employment for some workers, it would be possible to conceive mechanisms for adjusting to the minimum wage that would limit negative effects on the labor demand and encourage improvements in productivity and employment in businesses.

Since the minimum wage tends to be enforced more strictly in developing countries, the evidence indicates that the effects are even greater on these economies and have a disproportionate effect on workers who are less productive. A 10 percent increase in the minimum wage is typically associated with job losses ranging from zero to 5 percent, and they can be even greater. In the Philippines, for example an 8 percent job loss was seen in the manufacturing industry, and in Chile, female employment fell by 5.2 to 11.1 percent following a 10 percent increase in the minimum wage. The evidence suggests that less qualified workers whose productivity is below the minimum standard (women and young and inexperienced

workers) are most susceptible to losing their jobs or having their working hours reduced. One point is clear: in the great majority of cases, the impact of the minimum wage falls mainly on workers who are earning wages close to the minimum. The main lesson learned from these experiences is the importance of improving the productivity low-skilled workers and those with little working experience. To achieve this goal, the solution is to enhance their productivity by providing them with sufficient skills to earn a minimum wage in the formal sector of the economy. They will need quality education as well as job-related training for work that fits the needs of the market.

In fact, the literature in general shows that employers in several countries (both developed and developing) are replacing unskilled labor with more productive workers, and in some cases employers are looking for technology to upgrade their productive processes. Although this conclusion is not surprising, it is important to bear these implications in mind when changes are made in minimum wage policy, whether in terms of its level or its application, in order to minimize damaging effects on the most vulnerable workers. It is therefore a good idea to accompany these changes with instruments that will help the affected workers to deal with the negative consequences. Some of the interventions that have been recommended include improving the quality of the workforce whose skills do not justify earning the new minimum wage and providing access to unemployment insurance for workers who are left jobless, support programs for re-employment, and social protection for those workers who need it.

In some cases, there is less impact on employment, either because businesses fail to comply with the minimum wage law or because they opt for other channels (or a combination of channels) to adjust to the increase in wage costs. Therefore, some studies have concluded that the minimum wage contributes to expansion of the informal sector. Workers who have lost their jobs in formal businesses following increases in the minimum wage are forced to get jobs in the informal sector of the economy or as informal workers (without the social benefits enjoyed by workers in the formal sector of the economy). Since the proportion of informal employment in emerging economies is high, it is expected that any increase in the minimum wage, regardless of the amount, would result in further noncompliance with the law. It would therefore be advisable to identify the companies that are at greatest risk of disregarding the minimum wage law and offer them government support to discourage them from using this adjustment channel.<sup>11</sup> At the same time, it would be well to redouble efforts to enforce compliance with the law through media campaigns that inform workers about changes in the law and remind them of their rights.

As for the particular choice of ways in which businesses adjust, it may be concluded that those in more developed countries typically use three adjustment channels: raising prices on products

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<sup>11</sup> See note 2 on productivity as part of the institutional design of the minimum wage for suggestions on some of the interventions that businesses can adopt.



and cutting non-wage costs (second adjustment channel, discussed in section 6 above); implementing changes in the human resources structure (third channel) either through a freeze on hiring permanent personnel (rarely resorting to layoffs) or by increasing temporary or short-term contracts and making greater use of outsourcing strategies; and finally, making greater investments in technology, human capital, and the streamlining of administrative processes (fifth channel).

In less developed countries, on the other hand, businesses tend to rely on two approaches to adjust to changes in labor costs. One of these is through the third channel just mentioned, with the difference that layoffs are less common in developed countries, whereas in developing economies there are net job losses as well as increases in temporary or short-term contracts. The other adjustment channel is the use of informal employment (fourth channel). In other words, businesses that cannot pay the legal minimum wage may leave the formal sector, either partially or totally. However, it should be emphasized that these are only general trends; there are many exceptions in both types of countries. Given the context in emerging economies—economies which are highly dependent on foreign markets and companies with varying levels of sophistication—all the adjustment channels presented in this report are viable. Since many of its industries depend on cheap labor and since informal employment is ubiquitous, it is to be expected that there will be a bias toward using the channels that are most common in less-developed countries.

One of the main lessons that can be drawn from the experience of countries that have adopted measures of this kind is that more moderate increases in the minimum wage level tend to mitigate the negative impacts on unemployment and informal employment. In some cases, especially when the adjustment channels encourage improved productivity, changes in the level and management of the wage policy may have a positive impact. For example, when adjustments in the minimum wage are based on technical criteria related to the economic situation, employers can not only anticipate the changes and adapt to them more easily, but also make improvements that enable them to use more optimum adjustment methods. On the other hand, if the minimum wage level is excessively high or the adjustments are made without considering the country's economic reality, then any increase can generate more poverty and unemployment.

Finally, the evidence shows that only rarely is the final decision based on technical criteria alone. Therefore, the role of governments in emerging economies in the decision-making process should be to provide objective technical input and at the same time encourage all the parties involved in the deliberative process, through information-sharing and training, to take all the social and economic perspectives into account. Insofar as possible, the government should also emphasize (or introduce) measures that will help vulnerable workers improve their productivity, provide them with support while they are being trained, and, at the same time, offer measures that will help businesses inclined toward informal employment to make adjustments through channels that will lead to improvements in their productivity.

Below is a summary of measures that the government can consider to prevent informality from rising when minimum wage levels increase. These are broken down in three groups; 1) short-term measures for firms, which require financial support and can be fiscally unsustainable in the long term; 2) medium-term measures for firms, which focus on improving or fixing regulatory constraints, and addressing market and institutional failures that may limit firm performance; and 3) short- and medium-term measures for displaced workers or workers at risk.

- **Short-term targeted government assistance programs:** social security reductions (subsidies), wage subsidization, phasing-in approaches (delay in implementation), employment allowances of various types, subsidized training programs, and advisory services to improve production processes.
- **Medium- and longer-term assistance to firms:** reduction in labor costs (e.g. severance pay), co-financing of re-training programs for less productive workers, ease of access to regular financing and financing in the form of venture capital targeted to SMEs, introduce targeted loan guarantee schemes, support growth and international development through co-financed advisory services, support for technology transfer, and regular provision of sector-specific information to remain competitive and identify new opportunities. Review dissolution or bankruptcy laws to reduce shut-down costs and ease exit of unproductive firms.
- **For displaced workers:** strengthen public employment services, introduce or broaden the coverage of unemployment insurance, promote productive self-employment to reduce reliance on wage employment, and strengthen safety nets for workers in need of longer transition periods and at risk of long-term unemployment.