THE EFFECT OF MINIMUM WAGES ON EMPLOYMENT IN EMERGING ECONOMIES: A LITERATURE REVIEW

Stijn Broecke (OECD), Alessia Forti (OECD) and Marieke Vandeweyer (KU Leuven)

Abstract

The literature on the employment impact of minimum wages in emerging economies is scant, but growing rapidly. To date, virtually no attempt has been made to systematically review the existing evidence. Using both qualitative as well as quantitative (regression meta-analysis) methods, this paper reviews the evidence on the employment impact of increases in the minimum wage in ten major emerging economies (Brazil, Chile, China, Colombia, India, Indonesia, Mexico, the Russian Federation, South Africa and Turkey). Overall, increases in the minimum wage are found to have only a minimal (or no) impact on employment in emerging economies. While more vulnerable groups (the low-skilled, youth and low-wage earners) are slightly more likely to be negatively affected, these effects are quantitatively very small. The impact on formality is positive, but also extremely small. The paper does find evidence that more recent studies are more likely to find positive employment effects. There is also some indication that methodology and the type of data used might have an independent effect on the direction and significance of the minimum wage coefficient.

Introduction

Despite decades of research and hundreds of papers on the topic, the debate about the impact of minimum wages on employment in advanced economies is still raging. The recent exchanges in the United States between Dube *et al*. (2010), Allegretto *et al*. (2011), Allegretto *et al*. (2013), on the one hand, and Neumark *et al*. (2014; forthcoming), on the other, bear testimony to this fact. Yet two important conclusions do appear to emerge from this literature. The first is that most effects appear to be small and that the "debate over the employment effects of the minimum wage is [essentially] a debate of values around zero" (Freeman, 1996). The second is that the sign of the effect, if significant, appears often to boil down to a choice of methodology.

These negligible (or sometimes even positive) employment effects have seriously challenged the neoclassical model and its assumption of competitive labour markets, in which increases in price should result in declining demand. A number of attempts have been made to reconcile the theory with the data (Schmitt, 2013). One possibility is that labour markets are competitive after all, but that minimum wage effects are not necessarily felt through adjustments in the level of employment, but instead through reductions in non-wage benefits or training, or adjustments in the composition of employment. Another possible explanation is that minimum wages increase employment in situations where labour markets are monopsonistic. Other theories still argue that increases in the minimum wage may encourage employers to adopt productivity-enhancing practices and/or result in efficiency wage effects amongst employees. A final possibility is that higher minimum wages, by boosting the spending power of low-wage workers, result in higher demand for firms' products and, subsequently, employment growth. This Keynesian explanation has recently been used to argue for an increase in the minimum wage in the United States (Hall and Cooper, 2012).

While the effect of minimum wages on employment has been heavily researched in the developed world, much less is known about their impact in emerging economies. Yet there are important reasons to believe that the impact of minimum wages might be different in such settings. On the one hand, larger effects might be expected due to the fact that minimum wages in emerging economies are often set at a very high level (Herr and Kazandziska, 2011; World Bank, 2008) or because a greater proportion of the workforce is unskilled and earning at or near the minimum wage (Cunningham, 2007). In addition, and particularly in Latin American and Caribbean (LAC) countries, minimum wages frequently have an impact higher up the income distribution because they have tended to be used as an index for wage adjustments more generally, with wages and benefits expressed in multiples of the minimum wage (Maloney and Mendez, 2004).

However, there are also many reasons to expect the minimum wage to have very little impact on employment in emerging economies. One reason is that, in environments characterised by high levels of inflation, it may be very difficult to increase the real value of the minimum wage (Lustig and McLeod, 1997). Another, and possibly more important, reason is that the level of compliance with the minimum wage is frequently very low in these countries (Bhorat and Stanwix, 2013). This may be because the minimum wage is either set too high or too low (Saget, 2008; Lee and Sobeck, 2012; Rani *et al*., 2013), the system is too complex (Cunningham, 2007; Rani *et al*., 2013), there are no legislated fines/punishments for non-compliance, or the minimum wage is simply not enforced, possibly due to a lack of resources (Kristensen and Cunningham, 2006).

One reason why the minimum wage might be difficult to enforce in emerging economies is the existence of a large informal sector. In such contexts, increases in the minimum wage may have no effect on overall employment because a fall in formal sector employment may simply be compensated by a rise in informal sector employment as displaced workers migrate from one sector to the other. This generates a shift in the parameter of interest from the number of jobs that are available to the quality of jobs that people hold, and therefore the research (and policy) question may not necessarily be what impact the minimum wage has on employment overall, but rather on the split between formal and informal employment.

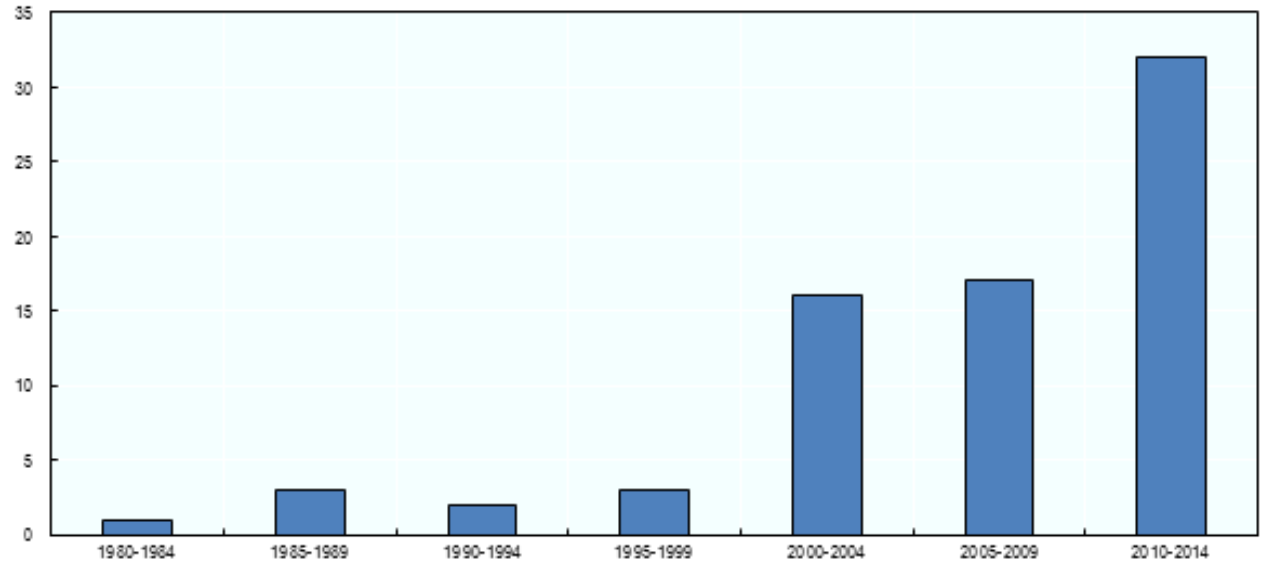
That said, the effect of minimum wages in the informal sector may be hard to predict. In some countries, minimum wages are interpreted as a signal of what constitutes a fair wage and are complied with even in the informal sector (Cunningham, 2007). Cunningham (2007), for instance, show that there is a significant spike in wages at or around the minimum wage level in a number of emerging economies, even in the informal sector. Some authors (Gramlich, 1976; Hamermesh, 1996; and Card and Krueger, 1995) have argued that the impact on informal sector wages depends on the price elasticity of demand for formal sector workers and that, under certain circumstances, an increase in formal sector wages could also drive up wages in the informal sector.

A number of papers have found a positive (negative) effect of minimum wages on formality (informality) (e.g. Foguel, 1998 for Brazil; Mora, 2007 for Colombia; Magruder, 2013 for Indonesia; Bhorat *et al*., 2014 for South Africa), and there are a number of ways in which one might be able to rationalise such a finding. One of these is a labour supply effect, with higher wages in the formal sector incentivising workers to look for a formal job (Fajnzylber, 2001). Another possibility is that income effects are at play, combined with intra-household substitution effects, so that when the minimum wage increases for household members employed in the formal sector, other household members can afford to reduce their labour supply in the informal sector (Fajnzylber, 2001). A third explanation is similar to the reason why positive employment effects of a minimum wage rise might be found in developed economies: i.e. increases in the minimum wage, through their effects on consumption and aggregate demand, raise the number of (formal) jobs in the economy (Magruder, 2013).

The impact of minimum wages on employment outcomes in emerging economies is therefore, to a large extent, an empirical issue. While the literature in this field has been growing rapidly and exponentially (Figure 1), there has been virtually no attempt to date to systematically review all this evidence. The present paper aims to fill this void. Based on both a qualitative and quantitative (meta-analysis) review of the literature for ten key emerging economies (Brazil, Chile, China, Colombia, India, Indonesia, Mexico, the Russian Federation, South Africa and Turkey), this paper finds that, overall, minimum wages are found to have very little, or no, effect on overall employment in emerging economies.[1] While the review finds that more vulnerable groups (e.g. youth, the low-skilled, and low-wage workers) are more adversely affected by increases in the minimum wage, the size of the impact is very small. Similarly, it is found that increases in the minimum wage are associated with increases (decreases) in formal (informal) employment, but again the effects are minuscule. This corroborates the qualitative literature review, which finds that the effect of minimum wages on formality is empirically ambiguous. Finally, the review finds very strong evidence that more recent studies are more likely to find positive employment effects. There is also some indication that the effect of minimum wages on employment may be influenced by the method and/or data used, and that the latter are systematically correlated with the country that is being studied.

Figure 1. Minimum wage studies in emerging economies, 1980-2014

Number of individual country studies by year of publication



The remainder of this paper proceeds as follows. In the first section, the minimum wage systems across the ten countries studied are described and compared, and some key labour market statistics are provided to set the scene. The following section provides a qualitative literature review for each of the countries of the impact of minimum wages on employment. The paper then proceeds to a more formal meta-analysis of the existing evidence. The final section discusses the findings and offers some concluding remarks.

Background and overview of minimum wage systems in key emerging economies

To set the scene, this first section provides: (i) some key labour market statistics for the ten emerging economies reviewed in this study; followed by (ii) a bird's eye view of the main characteristics of their minimum wage systems. A more detailed description of the minimum wage systems in each of the ten countries studied can be found in Annex A.

As shown by Table 1, most emerging economies have employment and unemployment rates similar to the OECD average, although performance varies markedly. While China boasts an unemployment rate of just 2.9%, nearly a quarter of the South African labour force is unemployed. Table 1 also demonstrates the high prevalence of informal employment in emerging economies[2] although, once again, there are large differences between countries with over 80% of all employment in the informal sector in India, compared to less than a third in China, South Africa, Turkey and the Russian Federation.[3]

Table 1. Key labour market statistics for emerging economies, 2013

	Unemployment rate	Employment rate	Informal employment
Brazil[a]	6.3%	67.2%	42.2%
Chile	6.2%	62.3%	35.8%
China[a]	2.9%	75.1%	32.6%
Colombia	9.7%	62.7%	59.6%
India[a]	3.7%	53.3%	83.6%
Indonesia	6.2%	62.7%	72.5%
Mexico	5.2%	61.0%	53.7%
Russian Federation	5.5%	68.8%	12.1% [b]
South Africa	24.7%	42.7%	32.7%
Turkey	9.9%	49.5%	30.6%
OECD countries (non-weighted average)	5.8%	65.3%	..

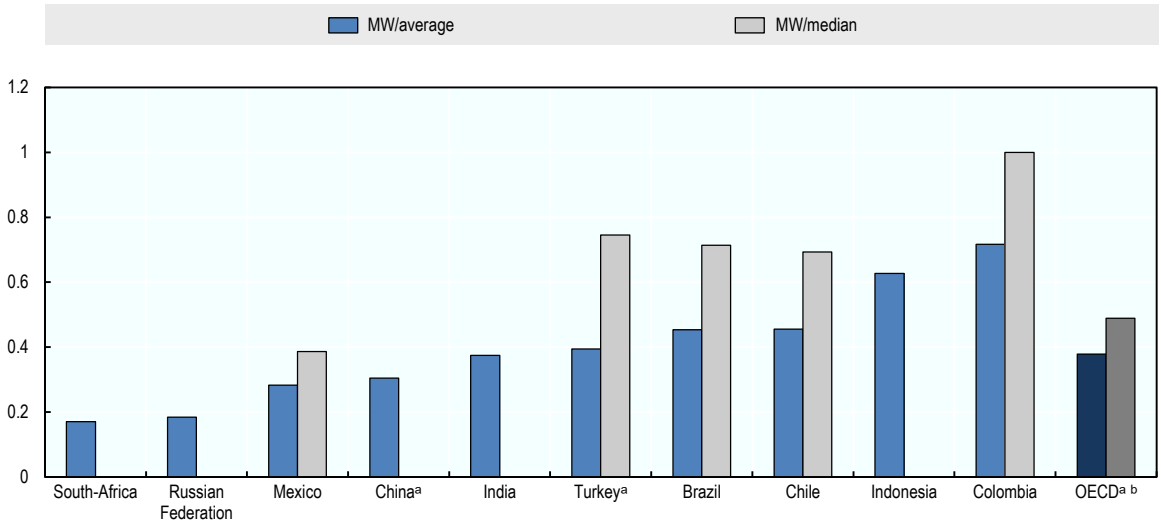
a. Unemployment and employment data: 2012 for Brazil and India; 2010 for China. Informality data: 2009 for Brazil, India, Indonesia, Mexico and Turkey; 2010 for China, Colombia, Russia and South Africa; 1995-1999 for Chile.

b. The data for the Russian Federation correspond only to persons in the informal sector.

Source: OECD for employment and unemployment (except Indonesia: ILO); ILO (2012) for informality; Charmes (2012) for Chile

Figure 2 shows that countries differ markedly not only in terms of general labour market conditions, but also in terms of the value at which the minimum wage is set (expressed as a proportion of average or median wages). Minimum wages are lowest in South Africa and the Russian Federation (at less than 20% of average wages), while they are highest in Indonesia (62.7%) and Colombia (71.6%).

Figure 2. Minimum wages relative to average and median wages, 2013



a. 2012.

b. Chile not included in OECD ratio to average; Chile and Mexico not included in OECD ratio to median.

Source: see annex B.

However, the actual cost to employers of hiring a minimum wage worker also depends on the level of social security contributions and payroll taxes. Social security contributions[4] differ considerably across countries, ranging from 0% in Chile and South Africa to 20% and over in Brazil, China and the Russian Federation (SSA, n.d.). In addition, social security contribution rates may vary by sector of economic activity and some employers therefore pay considerably less for a minimum wage worker than others. This is the case, for example, in Brazil and the Russian Federation (see Annex C for further information on social security contributions). In some countries, tax relief on payroll taxes is granted to employers under certain circumstances. In Colombia, for example, employers can deduct some payroll taxes for new employees earning less than 1.5 times the minimum wage for a maximum of two years (OECD, 2013).

Differences in minimum wage systems go beyond the value at which they are set. While some countries have a simple system with a single national minimum wage, others have highly complex arrangements where minimum wages vary across regions, sectors, occupations and age groups (Table 2). Colombia, Chile and Turkey boast the simplest systems, with a uniform national minimum wage (and a sub-minimum wage for young and/or older workers in Chile and Turkey). All other countries have some degree of regional and/or sector variation in their minimum wage levels. The most complex systems can be found in South Africa and India. In South Africa, minimum wage levels are set by sector, but these sector minimum wages can further differ by occupation, region, level of experience, firm size and hours worked. The complexity of the Indian system is due to a large number of sector minimum wages which can also vary by region, resulting in over 1 000 different minimum wage levels. Whereas in most countries minimum wages apply to all (formal) salaried workers, coverage is limited to certain unorganised sectors in India and South Africa. Rani *et al*. (2013) estimate legal coverage in those countries to be around 70%.

Minimum wages can be set either by national or regional governments. In Brazil and the Russian Federation, the national minimum wage set by central government serves as a lower limit for the minimum wages set by regional governments. India has a similar system, although the national minimum wage only serves as a non-binding recommendation to the regional governments. Only in Indonesia and China do the regions have full discretion over the minimum wages they set - although the Chinese government has on

several occasions requested some regions to adjust their minimum wages. In all countries but Brazil, Chile and the Russian Federation, it is mandatory to consult employee and employer organisations when revising the minimum wage. In spite of a lack of formal rules on the consultation process in Brazil, Chile and the Russian Federation, social partners are often involved. With the exception of the Russian Federation and Chile, all countries have explicit rules on the timing and mechanism of minimum wage adjustments.

Table 2. Minimum wage typology

	Set at … level		Variation			
	National	Regional	Region	Sector/occupation	Age	Other
Brazil	x	x	x	x		
Chile	x				x	
China		x	x			
Colombia	x					
India	x	x	x	x		
Indonesia		x	x	x		
Mexico	x		x	x		
Russian Federation	x	x	x			
South Africa	x		x	x		x
Turkey	x				x[a]	

[a] In 2014 the minimum wage was set at the same level for all age categories. It is not clear whether this is a permanent change or not.

While minimum wage systems differ on paper, they also differ in how they operate in practice. One such important difference is the degree of non-compliance (i.e. the share of covered workers earning less than the minimum wage).[5] While generally the degree of non-compliance is higher in emerging economies than in developed countries, it also varies significantly from one emerging economy to another. Compliance has been estimated to be highest in China (>97%)[6], Russian Federation (± 95%), Mexico (90.6%) and Chile (84.7%), and lowest in Indonesia (49.2%), Turkey (50.1%) and South Africa (52.9%) (World Bank and the Development Research Center of the State Council, 2013; Rani *et al*., 2013; Kanbur *et al*., 2013; Kapelyuk, 2014).

The evidence suggests that compliance tends to be lower when minimum wage systems are complex and/or minimum wages set at a high level (Rani *et al*., 2013). In addition, Bhorat (2014) argues that compliance varies depending on firm characteristics (firm size, the skill level of the workforce, and the degree of market power) and local labour market conditions (the level of unemployment, the average wage rage relative to minimum wage, the level of unionisation). Compliance can also be determined by the degree of monitoring and the threat (and size) of sanctions. In all countries, except for the Russian Federation, [7] a penalty is imposed on employers if non-compliance with the minimum wage is detected. However, significant differences exist across countries in the type and severity of the penalty. In all these countries, the penalty for non-compliance with the minimum wage entails a fine. Whilst in some the fine is a fixed amount that ranges from USD 9 (India) to around USD 24 000 in Brazil, in others (China, Colombia, Mexico and South Africa), the minimum wage, or the wage owed to employees, is used as a baseline for the calculation of the penalty. In a number of countries (India, Indonesia, and Mexico) the penalty can also entail imprisonment, the duration of which ranges from a maximum of three months in Indonesia, to a maximum of four years in Mexico.

The extent and effectiveness of enforcement is also likely to have an impact on compliance. The preferred proxy for measuring enforcement is the number of labour inspectors (Bhorat, 2014). The number of labour inspectors per 100 000 employed people is estimated to be lowest in Mexico (0.5),Turkey (2.6), and Colombia (3.5) and highest in South Africa (6.7) and China (6). [8] In many countries, such as in Brazil, Chile and India, attempts are made to find solutions in partnership with employers, rather than blindly applying sanctions which could endanger people's livelihoods. In some countries, the rules allow

temporary exemptions from paying the minimum wage, such as in Indonesia where companies who are not in a position to pay the minimum wage are allowed to pay their employees less than the minimum wage for a period not exceeding 12 months.

The impact of minimum wages on employment

Qualitative literature review

This section offers a country-by-country qualitative literature review of the impact of minimum wages on employment outcomes in emerging economies, covering a total of 74 studies. Most research has been carried out in Brazil (20%), Chile (18%) and China (15%), while there is hardly any evidence for India (0.01%) or Russian Federation (0.03%). The review covers primarily the impact of minimum wages on employment/unemployment, since this is the outcome that most studies have focused on. Where possible, however, the effect of minimum wages on hours worked and formality is also discussed.

In some countries, the evidence appears to converge on a negative impact of minimum wages on employment (Chile, China, Colombia), while in other countries there is very little evidence of any impact at all (Brazil, Russian Federation), and in others still, the evidence is inconclusive (India, Indonesia, Mexico, South Africa, Turkey). Often, however, authors argue that negative effects are stronger for youth, the low-skilled and low-wage workers. The impact of minimum wages on hours worked is much less well-researched, and the evidence appears inconclusive. Similarly, the relationship between minimum wages and formality is empirically unclear, and some positive effects of minimum wages on formality[9] have been found in Brazil, Colombia, Indonesia, the Russian Federation and South Africa.

Brazil

A relatively large number of studies have investigated the impact of the minimum wage on employment in Brazil, and these have recently been reviewed in detail in Broecke and Vandeweyer (forthcoming). While one (earlier) strand of the literature tended to find small- to medium-sized negative effects of the minimum wage on employment (Foguel, 1998, Foguel et al., 2001; Fajnzylber, 2001; Neumark *et al*., 2006; Carneiro, 2001)[10], a later series of studies carried out by Sara Lemos (2004a, 2005a, 2007, 2009a, 2009b) found no, or negligible effects – a result confirmed by Broecke and Vandeweyer (forthcoming) for more recent years.[11] Two studies have also investigated the effect of Brazil's state wage floors, but both found that compliance with these state minimum wages is extremely low and that they have had no effect on labour market outcomes (Moura and Neri, 2008; Corsueil, Foguel and Hecksher, 2013). While some studies have looked at more vulnerable groups (e.g. youth), the results tend to be inconclusive (see Broecke and Vandeweyer, forthcoming).

The relationship between minimum wages and hours worked has barely been investigated in the context of Brazil, and findings are contradictory: Lemos (2004a, 2005a) finds small negative effects, while Lemos (2009a) and Broecke and Vandeweyer (forthcoming) find no effect at all, and Neumark *et al*. (2006) find some weak positive effects.

Similarly, the evidence on the impact of minimum wages on formality is inconclusive in Brazil. While Carneiro and Corseuil (2001), Foguel et al. (2001) and Carneiro (2004) find that increases in the value of the minimum wage tend to decrease formal employment and increase informal employment, all other studies in Brazil find either no, or marginally positive, effects of minimum wages on informal employment. Lemos (2009a) finds no proof of employment effects in either formal or informal sectors, while Lemos (2009b) finds some evidence that increases in the minimum wage in fact decrease, rather than increase, employment of informal workers. Similarly, Fajnzylber (2001) finds larger negative employment

effects in the informal sector (meaning that informality has a tendency to fall as minimum wages increase) and Foguel (1998) finds a positive effect of minimum wages on formality.

Chile

Research on the employment effect of minimum wages in Chile mainly points to a negative impact on aggregate employment. While Martinez *et al*. (2001) and Miranda (2013) find no direct effect of the minimum wage on aggregate employment, they argue that the minimum wage has an indirect negative effect through its impact on average wages, and Cowan *et al*. (2004) show that minimum wage increases have led to aggregate job destruction. Minimum wage growth has also been associated with higher unemployment rates (Paredes and Riveros, 1993; Infante *et al*., 2003), although one older study (Solimano, 1988) finds a positive impact of minimum wage increases on aggregate employment, by estimating a full macroeconomic model with 1960-1985 data.

The evidence from Chile also suggests that the impact of minimum wages on employment is negative and more significant for more vulnerable groups. Paredes and Riveros (1989), Chacra Orfali (1990) and Cowan *et al*. (2004) all conclude that the minimum wage is more likely to have an impact on young people and people with lower educational attainment. Beyer and Dussaillant (2009) find that the minimum wage has a negative effect on youth employment, with young people mainly transitioning from work to unemployment or inactivity (rather than into study) following a rise in the minimum wage. Montenegro and Pages (2004) find that unskilled workers experience negative employment effects, while for skilled workers the impact of the minimum wage is positive. This finding holds for youth also, with young unskilled men experiencing a strong negative impact of the minimum wage, while there is no effect on young skilled workers. The minimum wage is also found to have a negative effect on the employment of low-wage workers (Castañeda, 1983; Paredes and Riveros, 1989; Grau and Landeretche, 2011).

While most Chilean studies do not make the distinction between formal and informal employment when assessing the impact of minimum wages, Wedenoja (2013) argues that the results for overall employment mask underlying shifts between formal and informal employment. When analysing both sectors separately, the results indicate that the minimum wage increases both the probability of being unemployed and of being employed in the informal sector.

China

The impact of minimum wages on labour market outcomes in China has received significant attention from researchers in recent years. Studies analysing aggregate employment generally point to a very small negative impact (Fang and Lin, 2013; Xiao and Xiang, 2009; Wang and Gunderson, 2012). Mayneris *et al.* (2014) show that a minimum wage increase has no impact on aggregate employment because of its positive impact on productivity.

However, effects have been found to differ significantly between the different Chinese regions which vary in their degree of development. Whereas Wang and Gunderson (2011; 2012) find that the minimum wage has no effect on employment in the Eastern (most developed) region and a negative impact in the slower growing Central and Western regions, the exact opposite is found by Ni *et al*. (2011) and Fang and Lin (2013). The distinction between urban and rural migrant workers is made in many studies, with rural workers mostly experiencing stronger negative effects (Ding, 2010; Fang and Lin, 2013; Luo *et al*., 2011). Negative employment effects are also found to be greater for low-skilled and female workers (Fang and Lin, 2013; Jia, 2014). Using firm-level data, both Ding (2010) and Huang *et al*. (2014) find stronger adverse effects on low-wage firms. Finally, there is some evidence of differential impacts by sector, with negative effects for the manufacturing sector and positive effects for the construction sector (Luo *et al*., 2011; Shi, 2011).

When focusing on hours worked rather than on employment, a positive effect of the minimum wage is found by Xiao and Xiang (2009). This is confirmed by Jia (2014), although only for low-skilled men, while no effect is found on hours worked for low-skilled women or for high-skilled workers.

Colombia

The majority of evidence on minimum wages in Colombia shows a negative impact on employment and a positive impact on unemployment (Bell, 1997; Hernandez Diaz and Pinzon Garcia, 2006; Arango and Pachón, 2004), which is perhaps not too surprising given the high level of the minimum wage in Colombia.

According to Aguirre Botero (2011), the young population is most likely to be affected by minimum wages and, in particular, those with low levels of education or experience, and those living in less educated families. These stronger effects on youth employment are confirmed by Arango and Pachón (2004) and Sánchez *et al*. (2009), but contradicted by Hernandez Diaz and Pinzon Garcia (2006). Stronger effects are also found for female and low-skilled workers (Arango and Pachón, 2004; Bell, 1997; Hernandez Diaz and Pinzon Garcia, 2006; Sánchez *et al*., 2009). Hernandez and Lasso (2003) find no significant employment effects of the minimum wage, not even when focusing on vulnerable groups such as young and low-skilled workers.

A negative effect on hours worked is found, which is stronger for younger and high-skilled workers (Arango and Pachon, 2004). While Mora (2007) finds that the probability of participation in the informal sector decreases as the minimum wage rises, Sánchez *et al*. (2009) show that there is a positive impact on informality.

India

There exists virtually no research on the effect of minimum wage legislation on employment in India. This is likely to be the consequence of the complexity of the minimum wage system and its limited coverage and enforcement (Belser and Rani, 2012). The only study this review encountered is Soundararajan (2014), who analyses the impact of the minimum wage on employment in the construction industry. Exploiting the difference in minimum wages and the number of labour inspectors between regions, the author finds a negative effect on employment for low levels of enforcement, and a positive effect for high levels of enforcement.

Indonesia

The evidence on the effect of minimum wages on aggregate employment in Indonesia is mixed, with Chun and Khor (2010), Rama (2001) and Atalas and Cameron (2003) finding no impact, Comola and De Mello (2011) finding a positive impact, and Islam and Nazara (2000) finding evidence for both negative and positive impacts. Suryahadi *et al.* (2003), focusing on the formal sector, finds a negative impact on employment, which is stronger for females, low-skilled youth and part-time workers, while there is evidence of positive effects on white collar employment. According to Del Carpio *et al*. (2012) only female non-production[12] workers and low-skilled production workers in small firms face negative effects of minimum wages. The difference between large and small firms is confirmed by Rama (2001), who only finds a significant negative impact on employment in small manufacturing firms.

A positive impact on hours worked is found, although not for female workers in rural areas and workers earning more than the minimum wage (Pratomo, 2014; Chun and Khor, 2010).

Only a few papers focus on the possible effect of minimum wages on formality and the evidence is inconsistent. On the one hand, Comola and De Mello (2011) find that the positive effect on aggregate

employment is driven by a positive impact on informal employment that fully offsets the negative impact on formal employment. This confirms the finding of Chun and Khor (2010) that the negative impact on low-wage formal sector workers does not translate into aggregate employment losses. On the other hand, Magruder (2013) shows that minimum wages increase full-time paid work and decrease self-employment, which is evidence for increased formalisation. This evidence is supported by the finding of a negative minimum wage effect on small firm employment and a positive effect on large firms.

Mexico

For Mexico, evidence on the employment effects of minimum wages is scarce and inconclusive. An important study by Bell (1997) compares the effect of minimum wages in Mexico and Colombia and finds that there are no significant effects on aggregate manufacturing employment in Mexico. The effect remains insignificant when making the distinction between skilled and unskilled workers. It is argued that the lack of impact is a consequence of the low level of the Mexican minimum wage. This conclusion differs from an earlier result pointing to a negative relation between minimum wages and manual employment (Samaniego de Villareal and Samaniego Breach, 1988) – although these different results could be due to the significant drop in the value of the real minimum wage over the period separating these two studies. Garza Cantú and Bazaldúa (2002) also find a negative impact on aggregate employment. When looking at different wage groups, however, their results show that people with low wages experience positive effects from a minimum wage increase, while the impact on higher wage earners is negative. When defining vulnerable groups in terms of age and sex, Feliciano (1998) finds that there is no impact on aggregate male employment, while it is positive for older men. The impact on aggregate female employment is negative and this negative effect increases with age.

Russian Federation

Research on the effect of minimum wages in the Russian Federation is very limited, which is likely to be because of the low level of the Russian minimum wage in comparison to average wages. It is therefore not surprising that the only two papers that look at the employment impact of minimum wages in the Russian Federation find no, or very little, effect. Kobzar (2009) finds no significant effect on either aggregate employment or unemployment, and the lack of statistically significant effect on unemployment is confirmed by Muravyev and Oshchepkov (2013). When focusing on different sub-groups, the latter authors find that the minimum wage has no impact on female unemployment, but does have a negative impact on youth unemployment. Both papers also look at the effects on the share of workers in informal employment. While Kobzar (2009) finds no effect, Muravyev and Oshchepkov (2013) find a significant positive effect. The latter also show that the effect was strongest in the most recent years of their sample (2007-2010).

South Africa

Although minimum wages were only introduced in South Africa in 1999, there are already several studies analysing their effects, albeit with conflicting conclusions. These studies have mainly focused on agricultural and domestic workers as these are the most vulnerable sectors. While most studies find no effect on the employment of farm workers (Muray and van Walbeek, 2007; Conradie, 2003; Conradie, 2005), Bhorat *et al*. (2014) find that minimum wages lead to a decreased probability of being a farm worker. For domestic workers, the evidence is also mixed: individual data point to no significant effect on the probability of being a domestic worker (Dinkelman and Ranchhod, 2012; Bhorat *et al*., 2013), while the results of the regional analysis of Hertz (2005) show a negative impact on domestic employment. A recent study by Bhorat *et al*. (2013) looks at all sectors and finds no effect on employment in any of them.

The effect on hours worked also differs between sectors. Murray and van Waelbeek (2007) argue that adjustments in the agricultural sector mainly happen at this intensive margin. This is confirmed by Bhorat *et al*. (2014) who find that average hours worked drop after a minimum wage increase. However, their results show that average hours increase in the most vulnerable regions, which they attribute to a decline in part-time jobs. The results for domestic employment are again mixed, with Dinkelman and Ranchhod (2012) and Bhorat *et al*. (2013) finding no significant effects on hours worked by domestic workers, and Hertz (2005) finding a negative impact. Bhorat *et al*. (2013) only find a significant negative effect in the retail and security sectors.

In South Africa, minimum wages are found to lead to increased formalisation for both agricultural and domestic workers (Bhorat *et al*., 2014; Dinkelman and Ranchhod, 2012). However, the impact on formality is found to differ between people of different sex and ethnicity, with a negative effect (that is stronger the lower the level of education level) for coloured and black women, a positive effect for coloured men, and no effect for white and black men or for white women (Millea *et al*., 2012).

Turkey

Analysis of the impact of minimum wages on the Turkish labour market is scarce and shows mixed results. When focusing on the aggregate economy, a negative impact on employment is found (Ozturk, 2006; Papps, 2012), while there seems to be no relation between minimum wages and unemployment (Korkmaz and Coban, 2006). Papps (2012) identifies the young and rural workers as the ones that are most negatively affected by the minimum wage. This differs from the results of Pelek (2011), who finds no effect on low-skilled youth employment and a positive impact on the employment rate of young workers with tertiary education. Whereas Gunsoy and Tekeli (2013) find no significant effect of minimum wages on female employment, Ozturk (2006) shows that the low female participation rate can to a large extent be attributed to minimum wages because the latter reduces the availability of flexible, part-time jobs.

The results on the impact of the minimum wage on the intensive margin, i.e. hours worked, are also contradictory: Ozturk (2006) finds a positive effect on hours worked, while Papps (2012) shows that minimum wage growth leads to a decrease in the number of days or hours worked, both in the main job and in the second job.

Given that young and low-skilled workers have relatively high probabilities of being employed in the informal sector in Turkey (OECD, 2008; Papps, 2012), Pelek (2011) looks at the effect of minimum wages on the share of formal work for different skill groups of young workers. She finds a positive effect of minimum wages on informal work for the low-skilled and, to a lesser extent, for medium-skilled young workers.

Meta-analysis 1: Coefficients

While a qualitative review may be useful in getting an overall sense of the results obtained in the literature, it is much more difficult to draw robust conclusions from it, particularly when the results point in different directions (as they do in the case of minimum wages and employment). With qualitative reviews, it is also more difficult to get a sense of how the magnitudes of different effects all add up and/or average out, within and across different studies. This section therefore attempts to quantify the impact of minimum wages on employment through a more objective meta-regression analysis, as described by Stanley and Jarrell (1998), and as previously applied to minimum wages by Doucouliagos and Stanley (2009) and Belman and Wolfson (2014a). As discussed below, a meta-analysis will also allow a more systematic investigation of whether the effect of minimum wages on employment varies by sub-group studied and/or depends on the methodology employed.

Meta-analyses are becoming increasingly popular to summarise the large number of studies on minimum wages and employment – although none have specifically looked at emerging economies. Meta-analyses of developed countries include Doucouliagos and Stanley (2009), Boockmann (2010), Leonard, Stanley and Doucouliagos (2014) and Belman and Wolfson (2014b). Nataraj et al. (2014) looks at low-income countries and only covers two emerging economies (India and Indonesia). Chletsos and Giotis (2015) include a few studies from emerging economies, including Indonesia (7), Brazil (4), Mexico (2), China (1) and Colombia (1) – but do not distinguish these countries from the other, (largely) developed countries they include in their study.

Descriptive statistics

The data collected for the first meta-analysis consist of all coefficients on the minimum wage variable in regressions where the dependent variable is employment and where the estimates obtained are in the form of elasticities. The latter condition restricts the number of observations available for the analysis, but was adhered to in order to ensure comparability of results. In a later section, this restriction will be relaxed by focusing on the signs of coefficients, rather than on their magnitude.

As shown by Table 3, the dataset compiled for the first meta-regression analysis covers 741 estimates from 26 studies and for 6 countries (Brazil, Chile, China, Colombia, Indonesia and Mexico).[13] The approach taken was to include all elasticities presented in each paper, and not just the authors' preferred results. This was to minimise the risk of subjectivity creeping into the analysis, and is in line with best practice in the recent meta-analysis literature (Doucouliagos and Stanley, 2009; Disdier and Head, 2008).

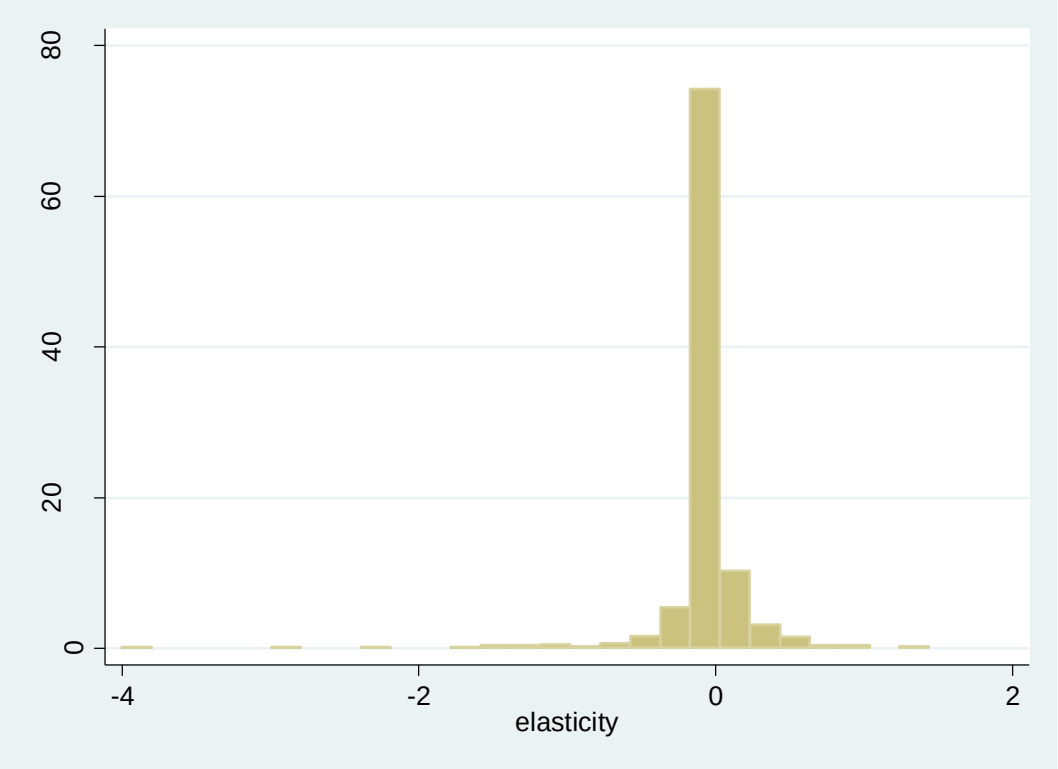
Table 3 shows that the average (unweighted) elasticity from these studies is -0.038 – i.e. a 10% increase in the minimum wage decreases employment by 0.38%. This is a very small effect. However, the estimates vary considerably between countries: a small positive effect is found in Brazil, Indonesia and China, while relatively strong negative effects are observed in Mexico and Colombia.[14] Only a third of all estimated coefficients are significantly different from zero and, as shown by Figure 3, the majority of the estimated coefficients (significant or not) are very close to zero.

Table 2. Summary statistics meta-analysis: elasticities

	N	Studies	Mean	Share negative	Share significant[a]	
					Negative	Positive
Brazil	343	10	0.002	0.638	0.204	0.067
Chile	21	3	-0.026	0.571	0.238	0.190
China	220	7	0.004	0.595	0.186	0.077
Colombia	25	1	-0.378	0.920	0.640	0.040
Indonesia	84	3	0.028	0.702	0.345	0.190
Mexico	48	3	-0.460	0.729	0.479	0.063
All	**741**	**26**[b]	**-0.038**	**0.646**	**0.248**	**0.086**

[a] An elasticity is said to be significant when it is at least twice its standard error.
[b] Because Bell (1997) studies both Colombia and Mexico, the total number of studies (26) does not equal the sum of the number of studies per country (27).

Figure 3. Distribution of elasticities



Model

Moving on to a more formal model for estimating the average impact of minimum wages on employment found in the literature, the effect size *e* obtained in study *i* can be related to the overall effect size β_0 (intercept) by the following equation:

$$e_i = \beta_0 + \varepsilon_i \quad \text{(i)}$$

However, if publication bias is present, then the effect size is likely to be related to its standard error. The rationale behind this is that authors using small samples need larger estimates to achieve the desired significance level and may therefore resort to data-mining and/or specification search in order to achieve the desired result. To control for this, the standard error of the coefficient, se_i is added to the regression:

$$e_i = \beta_0 + \beta_1 se_i + \varepsilon_i \quad \text{(ii)}$$

In addition, because the studies included in the meta-analysis use different sample sizes and methods, the error term in equations (i) and (ii) is likely to be heteroscedastic. To control for this, each observation in equation (ii) can be weighted by the inverse of its standard error:

$$t_i = \beta_o \frac{1}{se_i} + \beta_1 + \nu_i \quad \text{(iii)}$$

Where t_i is the conventional t-ratio of the reported effect, and β_o and β_1 are the coefficients to be estimated. More specifically, β_o remains the estimate of the average effect, while β_1 (the constant)

indicates the presence (or not) of publication bias. If β_1 is not statistically significantly different from zero, then there is no publication bias.

Studies (and estimates within studies) vary amongst each other both in terms of the samples they are based on (e.g. all, youth, low-skilled, female, etc…), as well as the methodologies employed (minimum wage variable used, level of disaggregation of data, etc…) – and these sample and method characteristics may, in turn, be systematically related to the outcome. Therefore, in the most complete model, additional controls X_{ij} for these characteristics can be added:

$$t_i = \beta_1 + \beta_o \frac{1}{se_i} + \sum_{j>1} \beta_j \frac{X_{ij}}{se_{ij}} + \nu_i \qquad \text{(iv)}$$

In practice, the sample controls included in the analysis below will consist of dummy variables for: country, skill group (i.e. whether the estimates are for all individuals, for the low-skilled only, or for the higher-skilled),[15] age group (all, young, older[16]), gender (all, female, male), wage group (all, low, higher[17]), formality (all, formal, informal) – as well as the average year of the study.[18] Methodological controls included are: whether or not the study was published in a peer-reviewed journal, the minimum wage variable used (Kaitz index, nominal MW, real MW, other), and the level of observation of the data used (individual, firm, region or country). In presenting the results below, the coefficients of all the dummy variables will be transformed so that they reflect deviations from the "grand mean" rather than deviations from the reference category, which makes them easier to interpret, and also allows the inclusion of the coefficients for the reference categories.[19] Finally, given that most papers report multiple elasticities, which are likely to be correlated, the standard errors will be clustered at the study-level.

Results

Table 4 reports the results from the first meta-regression analysis. The result of the most parsimonious model without controls (column 1) indicates that, overall, the effect of minimum wages on employment in the six emerging economies covered by the meta-analysis is negative, but extremely small: doubling the minimum wage results in a 0.03% reduction in employment. The constant is statistically significant (although only at the 10% level), suggesting that there may be some publication bias. In this case, the sign of the constant is negative, suggesting that there is bias towards finding negative results. In practice, however, this means relatively little, given that the model includes both studies published as working papers, and those published in peer-reviewed journals.

Subsequent columns analyse sets of explanatory variables on their own, while the last column adds all explanatory variables in together. The first observation to make is that the overall effect of the minimum wage on employment remains small, and even turns insignificant in the model that includes all explanatory variables simultaneously. Similarly, the magnitude of the constant remains similar and statistically significant throughout, except in the last model that includes the full set of controls.

Turning to the question of whether the impact varies by sub-group and/or methodology used, the following observations can be made. Only in one country is the effect of minimum wages systematically more negative, and significantly so, than in the others: Colombia. This is a country with an exceptionally high minimum wage, suggesting that minimum wages may have larger effects on employment if set at too high a level (although one caveat is that the coefficients included for Colombia in the meta-analysis are all relatively old, dating back to before 1995). There is much less evidence of a significant impact of minimum wages on employment in the other countries, apart for some positive coefficients. When the only controls included are country dummies, the effect on employment in Indonesia comes out positive, but this effect disappears when controlling for other variables (last column). The exact opposite happens for the coefficients of Brazil and Chile, both of which are insignificant in the model with just country controls, but

turn positive and significant in the model with full controls. In the case of Chile this may seem surprising, given that this is a country with a relatively high minimum wage, and that the qualitative literature review had suggested a negative effect of minimum wages on employment in this country. However, this result is likely to be related to the fact that a large number of estimates in Chile are based country-level data and that, as discussed below, results obtained using such data are significantly more likely to turn out negative. Including a control for method may therefore explain why the coefficient on Chile turns positive in the full model. Overall, it therefore appears safe to conclude that the effect of minimum wage increases on employment is minimal in emerging economies – except where they are set at an extremely high a level.

Table 4 provides some evidence that minimum wage increases may have a slightly more adverse impact on more vulnerable groups, such as youth, low-wage earners, and the least-skilled – however these effects are really very small. In the worst of cases, a doubling in the minimum wage is associated with a 0.8 percentage point greater fall in employment than the average (i.e. in a 1.2% fall in employment overall). The results also indicate that the impact of increasing the minimum wage is slightly more positive (negative) in the formal (informal) sector – although, once again, the size of the effect is very small.

One interesting result in Table 4 is that more recent estimates of the impact of minimum wages (i.e. post-1995) are significantly more likely to be positive than older estimates (pre-1995) – and this result remains even when excluding Colombia from the analysis. While in some countries, the real value of the minimum wage has fallen significantly over time (e.g. Mexico) and these results may therefore be 'real' in the sense that lower minimum wages would naturally result in smaller disemployment effects, it may also be significant that Card and Krueger's (1994) seminal study (finding that increases in the minimum wage increased employment) was published at around that time. This may have triggered a flurry of research more inclined to find positive employment effects. However, the findings may also be related to a shift over time in the methods and data used for analysing the impact of minimum wage hikes. For instance, older studies were more likely to use country-level data which, as shown in Table 4, are also associated with more negative estimates of the impact of minimum wages on employment. Either way, the results do suggest that data type and/or method used could have an independent impact on the sign and significance of the impact of minimum wages on employment. For instance, estimates obtained using changes in the nominal minimum wage are associated with a more negative employment impact.

Table 3. Results meta-analysis: Coefficients

		(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)	(ix)	(x)	(xi)	(xii)
Precision		-0.0003***	-.0003***	-.0003***	-.0003***	-.0003***	-.0003***	-.006**	0.001	-.0003***	-.0003***	-.0003***	-0.004
		0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.001	0.000	0.000	0.000	0.003
Country	Brazil		0.001										.040**
			0.007										0.015
	China		0.000										-0.006
			0.006										0.005
	Indonesia		0.037*										0.006
			0.021										0.010
	Mexico		0.001										-0.012
			0.008										0.017
	Colombia		-.043***										-.068***
			0.004										0.008
	Chile		0.004										.040***
			0.005										0.012
Skills	All			-0.001									-0.007
				0.003									0.004
	Low			-0.001									-.007*
				0.003									0.004
	Other			0.002									.014*
				0.006									0.008
Age	All				0.001								-.006**
					0.003								0.003
	Young				0.002								-.007**
					0.003								0.003
	Other				-0.002								.013**
					0.007								0.005
Wage	All					-0.003							-.003*
						0.002							0.002
	Low					-.007*							-.008**
						0.004							0.004
	Other					.010***							.011***
						0.003							0.002
Gender	All						0.001						0.005
							0.003						0.006
	Female						0.003						0.004
							0.004						0.007
	Male						-0.004						-0.009
							0.004						0.012
Formality	All							.002*					.002**
								0.001					0.001
	Formal							.002*					.001*
								0.001					0.001
	Informal							-.004**					-.003**
								0.002					0.001
Published	No								-0.001				-0.001
									0.000				0.001
	Yes								0.001				0.001

									0.000				0.001
Time	<1995									-.050***			-.074***
										0.011			0.009
	>=1995									.050***			.074***
										0.011			0.009
MW	Real										-0.001		0.001
											0.003		0.001
	Kaitz										0.004		.013***
											0.008		0.003
	Nominal										-0.004		-.016***
											0.005		0.003
	Other										0.001		0.002
											0.003		0.001
Observations	Regions											0.018	.040**
												0.019	0.017
	Firms											0.019	.101***
												0.018	0.023
	Countries											-0.057	-.180***
												0.055	0.052
	Individuals											0.020	.040**
												0.019	0.017
Constant		-0.624*	-0.699*	-0.638*	-0.630*	-0.634*	-0.615*	-0.596*	-0.656*	-0.669**	-0.646*	-0.653*	-0.578
		0.322	0.361	0.329	0.330	0.326	0.333	0.341	0.342	0.317	0.335	0.337	0.408
N		*741*	*741*	*741*	*741*	*741*	*741*	*741*	*741*	*741*	*741*	*741*	*741*

Source: Author's calculations based on elasticities from analysed papers. See Annex D for studies included in the meta-analysis.
Notes: Robust standard errors clustered at the study level, reported in parentheses. ***Significant at the 1% level, **Significant at the 5% level, *Significant at the 10% level.

Meta-analysis 2: Signs

The meta-analysis in the previous sub-section only used estimates of elasticities from the literature, thereby leaving out an important share of relevant research. In order to extend the analysis to a larger set of studies, the meta-analysis is re-run in this section using the signs of coefficients, regardless of whether they are estimated as elasticities or not. In this set-up, coefficients obtained in the literature are classified as either "insignificant", "significantly positive" or "significantly negative".[20] This approach was also used by Card *et al*. (2010) in their meta-analysis of active labour market programmes. While this method was later criticised by Stanley and Doucouliagis (2012) for causing spurious correlation, the significantly larger sample sizes that this approach enables to achieve make it worthwhile trying in the context of the present study. That said, additional caution is warranted in interpreting the results that follow. In particular, the sign analysis reveals nothing about the magnitude of the impact. So, while a certain factor may be associated with a higher likelihood of obtaining a negative result, that factor could still have a positive effect on employment in the coefficient analysis if many, very small negative effects are trumped by a few positive coefficients that are large. The sign meta-analysis should therefore be seen as a complement to the coefficient analysis of the previous section, and not on an equal footing.

Descriptive statistics

A focus on the coefficient signs allows the meta-analysis sample to be extended to a total of 1 020 observations from 57 studies covering 9 countries (i.e. all, with the exception of India).[21] Table 5 shows that the majority of the results included in the meta-analysis are not statistically significant (67.5%) and that, among the significant results, three-quarters are negative. Already, this supports the overall findings of the coefficient analysis: in most cases, minimum wages appear to have little effect on employment but, when they do, it tends to be negative.

Table 4. Summary statistics meta-analysis: Signs

	N	Studies	Insignificant	Negative	Positive
Brazil	364	14	0.753	0.203	0.044
Chile	27	7	0.481	0.296	0.222
China	267	11	0.663	0.247	0.090
Colombia	39	4	0.462	0.487	0.051
Indonesia	187	8	0.684	0.171	0.144
Mexico	52	4	0.500	0.442	0.058
Russian Federation	2	1	1	0	0
South Africa	50	5	0.580	0.280	0.140
Turkey	32	4	0.656	0.313	0.031
All	**1020**	**57**	**0.675**	**0.241**	**0.084**

Model

Given that the outcome variable now only takes one of three possible values, three separate regressions are estimated: one for the probability of obtaining a statistically significant negative result, one for the probability of a positive result, and one for the probability of a statistically insignificant result. These regressions are estimated using a linear probability model (for ease of interpretation):

$$p_i = \beta_0 + \sum_j \beta_j X_{ij} + \nu_i \qquad (4)$$

Where, as before, X_{ij} captures the various sample and methodology controls of the studies included in the analysis and p_i indicates the relevant probability. As before, standard errors are clustered at the study-level to account for the possible correlation of outcomes within studies, and the results are transformed to reflect deviations from the grand mean rather than from the baseline category. Unlike in the previous setup, however, it is no longer possible to control for publication bias or to reweight the estimates based on their precision.

While the control variables are the same as in the previous model, adding estimates that go beyond elasticities means that studies using different methodologies are now included and, therefore, that these can be controlled for. In particular, the effect on the likelihood of finding a positive/negative/insignificant effect as a result of using one of the following methods can be explored: a difference-in-differences estimation; time series techniques (VAR, VEC); or macro-economic models (as opposed to a traditional regression). However, because a strong correlation exists between methodology and the minimum wage variable and data type used, these cannot be added simultaneously to the model. The methodology controls will therefore be confined to an annex (Annex E).

Results

The results from the signs meta-analysis are presented in Table 6 below. As before, columns (i) to (x) investigate the effect of individual controls on their own, and the last column (xi) includes all controls simultaneously. For ease of presentation, this column spreads over the two tables/pages. Many of the results from the previous analysis are confirmed. So, for instance: older studies are more likely to find negative effects; estimates are more likely to be negative (less likely to positive) when looking at more vulnerable groups (although the differences in probability are often very small); and estimates are more likely to be negative in the case of Colombia (although not significantly so when all control are included simultaneously) and positive in the case of Brazil. Finally, the Kaitz index continues to be associated with more positive coefficients.

There are also some differences. Some of these are minor. For instance, while the previous results found a very small effect on informality, the present analysis suggests no difference on the likelihood of positive/negative effects by sector. Overall, this suggests that minimum wages have very little effect on formality in emerging economies. The sign analysis also suggests that studies published in peer-reviewed journals are more likely to find a positive effect – but clearly this does not translate into a more positive coefficient on average. Looking at the different countries, the effects are more likely to be positive in Brazil, Indonesia and Turkey, and more likely to be negative in China, Colombia and Mexico. Finally, regarding the minimum wage variable used, both the Kaitz and the real minimum wage are associated with a higher likelihood of finding a positive effect. There is very little evidence, however, that the type of data used significantly affects the sign of the coefficient. While not reported in Table 6 below, there is also very little evidence to suggest that the method used might matter significantly (Annex E).

Table 5. Meta-regression results: Signs

		(i)			(ii)			(iii)			(iv)			(v)			(xi)		
		Neg.	No	Pos.	Neg.	No	Pos.	Neg.	No	Pos.	Neg.	No	Pos.	Neg.	No	Pos.	Neg.	No	Pos.
Country	Brazil	-0.068	0.111	-0.043*													-.214***	.282***	-.068**
		(0.089)	(0.091)	(0.023)													(0.069)	(0.074)	(0.032)
	Indonesia	-0.100	0.042	0.058													-.128**	0.097	0.031
		(0.078)	(0.103)	(0.043)													(0.057)	(0.072)	(0.036)
	China	-0.024	0.021	0.003													.143**	-.119**	-0.024
		(0.061)	(0.049)	(0.042)													(0.061)	(0.057)	(0.034)
	Turkey	0.041	0.014	-0.055*													0.183	-0.168	-0.015
		(0.102)	(0.086)	(0.031)													(0.147)	(0.139)	(0.047)
	Chile	0.025	-0.161	0.135													0.054	-0.203	0.149
		(0.060)	(0.129)	(0.101)													(0.089)	(0.135)	(0.105)
	Mexico	0.171**	-0.142	-0.029													0.083	-0.122	0.039
		(0.073)	(0.091)	(0.035)													(0.079)	(0.088)	(0.038)
	RSA	0.009	-0.062	0.053													0.031	0.017	-0.048
		(0.093)	(0.162)	(0.112)													(0.082)	(0.126)	(0.077)
	Colombia	0.216*	-0.181	-0.035													0.134	-0.172	0.038
		(0.115)	0.124)	0.029)													(0.098)	(0.113)	0.047)
	Russia	-.271***	.359***	-.087***													-.286***	.389***	-0.103**
		(0.029)	(0.037)	(0.021)													(0.061)	(0.068)	(0.041)
Skills	All				0.028	-0.067	0.039**										.091***	-.137***	.046***
					(0.049)	(0.048)	(0.016)										(0.024)	(0.025)	(0.017)
	Low				0.041	-0.013	-0.028*										0.074**	-0.051	-0.022
					(0.084)	(0.081)	(0.016)										(0.035)	(0.033)	(0.022)
	Other				-0.069	0.080	-0.011										-.165***	.188***	-0.023
					(0.051)	(0.054)	(0.023)										(0.033)	(0.035)	(0.022)
Age	All							-0.007	-0.002	0.008							.071**	-0.079**	0.009
								(0.042)	(0.040)	(0.017)							(0.027)	(0.035)	(0.018)
	Young							-0.068	0.105	-.037***							-0.018	0.042	-0.024
								(0.065)	(0.064)	(0.011)							(0.032)	(0.028)	(0.016)
	Other							0.075	-.104*	0.028							-0.053	0.037	0.016
								(0.051)	(0.054)	(0.021)							(0.041)	(0.043)	(0.026)
Wage	All										0.088	-0.104*	0.016				0.072	-.160**	0.087**
											(0.058)	(0.056)	(0.015)				(0.053)	(0.066)	(0.033)
	Low										0.015	-0.008	-0.007				-0.009	0.029	-0.020
											(0.054)	(0.039)	(0.019)				(0.044)	(0.038)	(0.022)
	Other										-.103**	.112***	-0.009				-0.063	.131**	-.068***
											(0.050)	(0.041)	(0.013)				(0.050)	(0.058)	(0.023)
Gender	All													-0.034	0.057	-0.023	-0.023	0.021	0.002
														(0.042)	(0.050)	(0.029)	(0.041)	(0.042)	(0.026)
	Female													0.136*	-0.135**	-0.001	.131**	-.123**	-0.008
														(0.068)	(0.060)	(0.022)	(0.061)	(0.053)	(0.020)
	male													-0.102*	0.078	0.024	-0.108*	0.102*	0.006
														(0.054)	(0.056)	(0.019)	(0.058)	(0.053)	(0.024)
Cons		.271***	.642***	.087***	.218***	.726***	.056***	.251***	.669***	.080***	.166***	.763***	.071***	.264***	.635***	.101***			
		(0.027)	(0.035)	(0.021)	(0.057)	(0.056)	(0.015)	(0.048)	(0.046)	(0.019)	(0.055)	(0.050)	(0.012)	(0.043)	(0.051)	(0.031)			
	N	*1020*	*1020*	*1020*	*1020*	*1020*	*1020*	*1020*	*1020*	*1020*	*1020*	*1020*	*1020*	*1020*	*1020*	*1020*			

Table 6. Meta-regression results: Signs (cont.)

		(vi)			(vii)			(viii)			(ix)			(x)			(xi)		
		Neg.	No	Pos.	Neg.	No	Pos.	Neg.	No	Pos.	Neg.	No	Pos.	Neg.	No	Pos.	Neg.	No	Pos.
Formality	All	0.003	0.068	-0.071													-0.010	0.078	-0.069
		(0.048)	(0.075)	(0.061)													(0.036)	(0.057)	(0.053)
	Formal	0.061	-0.017	-0.045													0.066	0.021	-0.087
		(0.047)	(0.060)	(0.059)													(0.053)	(0.037)	(0.055)
	Informal	-0.064	-0.051	0.115													-0.056	-0.099	0.155
		(0.061)	(0.115)	(0.117)													(0.064)	(0.071)	(0.102)
Published	No				0.043	-0.039	-0.004										.101***	-.115***	0.013
					(0.039)	(0.041)	(0.018)										(0.026)	(0.029)	(0.017)
	Yes				-0.043	0.039	0.004										-.101***	.115***	-0.013
					(0.039)	(0.041)	(0.018)										(0.026)	(0.029)	(0.017)
Time	<1995							0.066*	-0.052	-0.014							.130***	-.111***	-0.020
								(0.038)	(0.039)	(0.017)							(0.031)	(0.037)	(0.023)
	>=1995							-0.066*	0.052	0.014							-.130***	.111***	0.020
								(0.038)	(0.039)	(0.017)							(0.031)	(0.037)	(0.023)
MW	Real										0.002	-0.072	.070**				0.059	-.114**	0.054*
											(0.049)	(0.068)	(0.035				(0.037)	(0.055)	(0.030)
	Kaitz										0.067	-0.013	-.054***				-0.001	0.059	-.059***
											(0.046)	(0.045)	(0.017)				(0.033)	(0.038)	(0.022)
	Nominal										-0.076	0.042	0.034				-0.085	0.059	0.026
											(0.057)	(0.067)	(0.026)				(0.064)	(0.069)	(0.030)
	Other										0.007	0.042	-.050***				0.026	-0.004	-0.022
											(0.066)	(0.070)	(0.017)				(0.055)	(0.062)	(0.027)
	Regions										0.009	0.023	-0.032				0.045	-0.067	0.022
											(0.055)	(0.058)	(0.025)				(0.053)	(0.061)	(0.034)
Obs.	Individuals													-0.088	0.080	0.008	0.106**	-0.138*	0.032
														(0.067)	(0.088)	(0.038)	(0.053)	(0.074)	(0.046)
	Firms													0.025	-0.049	0.025	-0.080	0.062	0.018
														(0.056)	(0.063)	(0.033)	(0.062)	(0.063)	(0.040)
	Countries													0.054	-0.054	0.000	-0.072	0.143	-0.071
														(0.096)	(0.120)	(0.048)	(0.095)	(0.129)	(0.062)
Cons		.225***	.632***	.143**	.228***	.686***	.086***	.253***	.665***	.082***	.246***	.668***	.087***	.246***	.654***	.100***	0.069	.899***	0.032
		(0.042	(0.073	(0.061	(0.039	(0.040	(0.018	(0.037	(0.038	(0.017	(0.042	(0.048	(0.014	(0.043	(0.050	(0.022	(0.088)	(0.106)	(0.064)
N		*1020*	*1020*	*1020*	*1020*	*1020*	*1020*	*1020*	*1020*	*1020*	*1020*	*1020*	*1020*	*1020*	*1020*	*1020*	*1020*	*1020*	*1020*

Source: Author's calculations based on signs from analysed papers.
Notes: Robust standard errors clustered at the study level, reported in parentheses. ***Significant at the 1% level, **Significant at the 5% level, *Significant at the 10% level.

Discussion

This paper has attempted to offer a review of the burgeoning literature on the employment impact of minimum wages in ten large emerging economies. A particular contribution to the literature is that the evidence presented in this study extends beyond the usual group of Latin American countries. Both the qualitative review (covering 74 studies) and the meta-analyses of coefficients and signs (covering 26 and 57 studies, respectively) indicate that, in most cases, minimum wage increases appear to have no impact on employment and that, when there is an impact, it tends to be negative but small. Equally, while more vulnerable groups appear to be more adversely affected by increases in the minimum wage, the effects again tend to be relatively small. These findings are remarkable, and very much in line with the growing consensus around the impact of minimum wages on employment in more advanced economies. Moreover, the review indicated that there is very little evidence that increases in minimum wages lead to more informality. If anything, the disemployment effects of minimum wage rises were found to be slightly higher in the informal than in the formal sector.

The review also makes it clear, however, that many questions remain unanswered in the debate around minimum wages in emerging economies and that considerably more research will be needed to answer these. First, minimum wage analyses (including in advanced economies) often take the minimum wage as a given, and look at the impact of increases in that minimum wage on employment. Very few (if any) studies ask the question of what would happen in a world without minimum wages. Second, while this study reviewed 74 studies, differences in sub-samples and, in particular, methods used across papers often make it very difficult to compare the results. Indeed, the coefficient meta-analysis could only draw on a sub-sample of 26 studies that reported findings in the form of elasticities. Third, while minimum wages in emerging economies appear to have little overall effect on employment, the reasons for why that might be remain unclear and, in particular, the extent to which non-compliance plays a role. The initial evidence presented in this study suggests that neither formal nor informal employment appear to be significantly affected by minimum wage increases, however future research should more consistently explore the impact of minimum wages on formality. Finally, the present study focused on employment impacts of the minimum wage. While most research is in this area, there is an important need also to understand what effect minimum wages might have on both poverty and inequality in emerging economies.

Such further research is also critical from a policy perspective, and the regular monitoring and evaluation of the impact of minimum wages should become institutionalised in those emerging economies where this is not already the case. To stimulate such analysis, it is of course important to improve access to better data, but also to set up dedicated bodies where such information can be exchanged and discussed. In some countries, decisions on minimum wage increases are taken (or at least informed by) independent expert commissions that base their recommendations on accurate, up-to-date and impartial information and advice that carefully considers current and future labour market conditions. With regards to uprating minimum wages, the results of this paper also support the practice of regular adjustments, rather than infrequent and very large increases, which are more likely to have negative employment effects. Regular updates, especially where they are combined with independent expert commissions, also reduce the risk of minimum wage policy be influenced by political considerations, paying little heed to current and future labour market conditions. Finally, the results of this chapter point to the need for improving the coverage and, in particular, the compliance with minimum wages in emerging economies.

References

Aguirre Botero, Y. C. (2011), "Efectos del salario mínimo sobre el estatus laboral de los jóvenes en Colombia" [The impact of minimum wages on the labor status of youth in Colombia], *Universidad de Antioquia Borradores Departamento de Economía*, No. 40, Medellín, Colombia.

Adwani, N. (2013), *Employment and Employee Benefits in Indonesia: Overview*, Association of Corporate Counsel, Ali Budiardjo, Nugroho, Reksodiputro (ABNR).

Allegretto, S., A. Dube and M. Reich (2011), "Do minimum wages really reduce teen employment? Accounting for heterogeneity and selectivity in state panel data", *IRLE Working Paper*, No. 166-08, available: http://irle.berkeley.edu/workingpapers/166-08.pdf.

Allegretto, S., A. Dube and M. Reich (2013), "Credible research designs for minimum wage studies", *IRLE Working Paper*, No. 148-1, available: http://irle.berkeley.edu/workingpapers/148-13.pdf.

Arango, A. C., and A. Pachón (2004), "The minimum wage in Colombia: Holding the middle with a bite on the poor", *Banco de la República Borradores de Economía*, No. 280.

Alatas, V. and L.A. Cameron (2003), "The impact of minimum wages on employment in a low income country: An evaluation using the difference-in-differences approach", *World Bank Policy Research Paper*, No. 2985.

Baker & McKenzei (2014), "Colombia – New minimum monthly statutory salary and transportation allowance for year 2014", [online], available: http://www.bakermckenzie.com/files/Publication/ba82c378-fe84-4521-8c85-ecce12261a82/Presentation/PublicationAttachment/168050ae-e5e1-4f26-9ad2-f93cb2febd34/AL_Colombia_NewMinimumSalary_Jan14.pdf. Accessed 13 November 2014.

Bell, L.A. (1997), "The impact of minimum wages in Mexico and Colombia", *Journal of Labor Economics*, Vol.15/3, pp. S102-S135.

Belman, D. and P.J. Wolfson (2014a), *What Does the Minimum Wage Do?*, Kalamazoo, MI: W.E. Upjohn Institute for Employment Research.

Belman, D. and P.J. Wolfson (2014b), "The new minimum wage research", *Employment Research*, Vol. 21/2, pp. 4-5.

Belser, P. and U., Rani (2010), "Extending the coverage of minimum wages in India: Simulations from household data", *Conditions of Work and Employment Series*, No. 26, ILO, Geneva.

Belser, P. and U. Rani (2012), "The effectiveness of minimum wages in developing countries: The case of India", *International Journal of Labour Research*, Vol. 4/1, pp. 45-66.

Benassi, C. (2011), "The implementation of minimum wage: Challenges and creative solutions", *ILO Working Paper*, No. 12, ILO, Geneva.

Beyer, H. and F. Dussaillant (2009), "Reajuste del salario mínimo: la importancia de ser prudentes", [Minimum wage adjustment: the importance of being cautious], *Centro de estudios públicos-puntos de referencia*, No. 312.

Bhorat, H., A. Kanbur and N. Mayet (2012), "Minimum wage violation in South Africa", *International Labour Review*, Vol. 151/3, pp. 277-287.

Bhorat, H., R. Kanbur and N. Mayet (2013), "The impact of sectoral minimum wage laws on employment, wages, and hours of work in South Africa", *IZA Journal of Labor & Development,* Vol. 2/1.

Bhorat, H., R. Kanbur and B. Stanwix (2014), "Estimating the impact of minimum wages on employment, wages and non-wage benefits: The case of agriculture in South Africa", *American Journal of Agricultural Economics*, Vol. 96/5.

Bhorat, H., and B. Stanwix (2013), "Mimum wage enforcement in the developing world", *DPRU Policy brief*, No. 13/29.

Bhorat, H. (2014), *Compliance with minimum wage laws in developing countries*, IZA World of Labor 2014: 80.

Bolsheva, A. (2012), "Minimum wage development in the Russian Federation", *ILO Working paper,* No. 15, ILO, Geneva.

Boockmann, B. (2010), "The combined employment effects of minimum wages and labor market regulation – A meta-analysis", *IAW Discussion Papers*, No. 65.

Bosch, M. and M. Manacorda (2010), "Minimum wages and earnings inequality in urban Mexico", *American Economic Journal: Applies Economics*, Vol. 2/4, pp. 128-149.

Broecke, S. and M. Vandeweyer (forthcoming), "Doubling the minimum wage and its effect on employment: Evidence from Brazil", *OECD Social, Employment and Migration Working Papers*, OECD Publishing, Paris.

Card, D., J. Kluve and A. Weber (2010), "Active labour market policy evaluations: a meta-analysis", *The Economic Journal*, Vol. 120/548.

Card, D. and A.B. Krueger (1995), *Myth and Measurement: The Economics of the Minimum Wage*, Princeton University Press.

Card, D. and A.B. Krueger (1994), "Minimum wages and employment: A case study of the fast-food industry in New Jersey and Pennsylvania", *The American Economic Review*, Vol. 84/4, pp. 772-793.

Carneiro, F.G. (2001), "An overview of the effects of the minimum wage on the Brazilian labour market", *Catholic University of Brasilia Working Paper*, No. 39.

Carneiro, F.G. (2004), "Are minimum wages to blame for informality in the labour market?", *Empirica*, Vol. 31, pp. 295-306.

Carneiro, F.G. and C.H. Corseuil (2001), "The impact of minimum wage changes on employment and wages in Brazil: Evidence from time series and longitudinal data", *Proceedings of the III International Colloquium*, pp. 163-189, Brasília, DF.

Castañeda, T. (1983), "Salarios mínimos y empleo en el Gran Santiago" [Minimum wages and employment in Gran Santiago], *Cuadernos de Economía*, No. 61.

Chacra Orfali, V. (1990), "Efectos del salario mínimo: aplicación del método Tobit" [Minimum wage effects: application of the Tobit method], *Cuadernos de Economía*, Vol. 27/80, pp. 83-101.

Charmes, J. (2012), "The informal economy worldwide: trends and characteristics", *Margin: The Journal of Applied Economic Research*, Vol. 6/2.

Chletsos, M. and G.P. Giotis (2015), "The employment effect of minimum wage using 77 international studies since 1992: A meta-analysis", *Munich Personal RePEc Archive Papers*, No. 61321.

Chun, N. and N. Khor (2010), "Minimum wages and changing wage inequality in Indonesia", *Asian Development Bank Economics Working Paper*, No. 196.

Coleman, N. (2013), "Towards new collective bargaining, wage and social protection strategies in South-Africa – Learning from the Brazilian Experience", *ILO Global Labour University Working paper*, No. 17.

Conradie, B. (2003), "Labour, wages and minimum wage compliance in the Breërivier Valley six months after the introduction of minimum wages", *CSSR Working paper*, No. 51.

Conradie, B. (2005), "Wages and wage elasticities for wine and table grapes in South Africa", *Agrekon*, Vol. 44/1.

Comola, M. and L. de Mello (2011), "How does decentralized minimum wage setting affect employment and informality? The case of Indonesia*", Review of Income and Wealth*, Vol. 57, pp. S79-S99.

Cowan, K. *et al.* (2004), "Un diagnóstico del desempleo en Chile" [An assessment of unemployment in Chile], Banco Interamericano de Desarrollo, *Serie de Estudios Económicos y sociales*, No. 1-04-012.

CSGB (2014), "Asgari ücretin net hesabi ve işverene maliyeti" [Minimum wage and employer cost] [online], available: www.csgb.gov.tr/csgbPortal/cgm.portal?page=asgari. Accessed 12 November 2014.

Cunningham, W.V. (2007), *Minimum Wages and Social Policy: Lessons from Developing Countries*, The Wold Bank, Washington.

Del Caprio, X., H. Nguyen and L. C. Wang (2012), "Does the minimum wage affect employment? Evidence from the manufacturing sector in Indonesia", *World Bank Policy Research Working Paper*, No. 6147.

Department of Labor (2014), *Update: The Colombian Labour Action Plan: Three Years Later, April 7 2014*, Department of Labor, United States of America.

Departamento de Inspección (2014), "Tipificador de hechos infracciónales y pauta para aplicar multas administrativas" [Classification of infringements and rules to apply administrative fines], Dirección de Trabajo-Gobierno de Chile, available: www.dt.gob.cl/1601/articles-98361_recurso_2.pdf. Accessed 12 November 2014.

Ding, S. (2010), "Employment effects of minimum wage regulation and cross effect of the employment contracts law", *Social Sciences in China*, Vol. 31/3, pp. 146-167.

Dinkelman, T. and V. Ranchhod (2012), "Evidence on the impact of minimum wage laws in an informal sector: Domestic workers in South Africa", *Journal of Development Economics*, Vol. 99/1, pp. 27-45.

Disdier, A.C. and K. Head (2008), "The puzzling persistence of the distance effect on bilateral trade", *The Review of Economics and Statistics*, Vol. 90/1, pp. 37-48.

Doucouliagos, H. and T.D. Stanley (2009), "Publication selection bias in minimum-wage research? A meta-regression analysis", *British Journal of Industrial Relations*, Vol. 47/2, pp. 406-428.

Du, Y. and W. Pan (2009), "Minimum wage regulation in China and its applications to migrant workers in the urban labor market", *China & World Economy*, Vol. 17/2, pp.79-93.

Dube, A., T.W. Lester and M. Reich (2010), "Minimum wage effects across state borders: Estimates using contiguous counties", *The Review of Economics and Statistics*, Vol. 92/4, pp. 945-964.

Fang, T. and C. Lin (2013), "Minimum Wages and Employment in China", *IZA Discussion Paper*, No. 7813.

Fajnzylber, P. (2001), "Minimum wage effects throughout the wage distribution: Evidence from Brazil's formal and informal sectors", *Textos Para Discussão*, No. 151, Universidade Federal de Minas Gerais, Belo Horizonte.

Feliciano, Z.M. (1998), "Does the minimum wage affect employment in Mexico?", *Eastern Economics Journal*, Vol. 24/2.

Foguel, M.N. (1998), "Uma avaliação dos efeitos do salário mínimo sobre o mercado de trabalho no Brasil" [An evaluation of the effects of the minimum wage on the labour market in Brazil], *Textos Para Discussão*, No. 564, Ipea, Rio de Janeiro.

Foguel, M.N., L. Ramos and F. Carneiro (2001), "The impact of the minimum wage on the labour market, poverty and fiscal budget in Brazil", *Textos Para Discussão*, No. 839, Ipea, Rio de Janeiro.

Foguel, M.N. and J.S. de Melo Costa (2014), "Mudanças nos principais indicadores do mercado de trabalho Brasileiro : Uma análise com base nas PNADs de 2001 a 2013", [Changes in key indicators of the Brazilian labour market: An analysis based on the 2001-2013 PNADs], *Notas Técnica*, No. 19, Ipea, Brasília.

Freeman, R.B. (1996), "The minimum wage as a redistributive tool", *The Economic Journal*, Vol. 106/436, pp. 639-649.

Garza Cantú, V., and F. Bazaldúa (2002) "La dinámica macroeconómica de los salarios mínimos en el empleo de México: Un análisis empírico 1983–2000" [The macroeconomic dynamics of mínimum wages and employment in Mexico], in Comisión Nacional de los Salarios Mínimos (ed.), *Comisión Consultiva para la Modernización del Sistema de los Salario Mínimos: Estudios y Ponencias*, STPS, Mexico D.F.

Government of India (2012), *Report on the Minimum Wage Act, 1948 for the Year 2012*, Government of India, Ministry of Labour and Employment. Available: http://labourbureau.nic.in/MW_Report_2012.pdf. Accessed 12 November 2014.

Gramlich, E.M. (1976), "Impact of minimum wages on other wages, employment and family incomes" *Brookings Papers on Economic Activity*, No. 2, pp. 409-451.

Grau, N. and O. Landerretche (2011), "The labor impact of minimum wages: A method for estimating the effect in emerging economies using Chilean panel data", *Serie Documentos de Trabajo (SDT),* No. 329.

Günsoy, G. and S. Tekeli (2013), "Time series analysis for effect of the minimum wage on female employment in Turkey", *International Journal of Business and Social Science*, Vol. 4/6.

Hall, D. and D. Cooper (2012), "How raising the federal minimum wage would help working families and give the economy a boost", *Economic Policy Institute Issue Brief*, No. 341.

Hamermesh, D. S. (1996), *Labor Demand*, Princeton University Press.

Hernandez Diaz, G. and E. Pinzon Garcia (2006), "El efecto del salario mínimo sobre el empleo y los ingresos" [The impact of the mínimum wage on employment and income], *Departamento Nacional de Planeación, Archivos de economía*, No. 316.

Hernandez, G. and F.L. Lasso (2003), "Estimación de la relación entre salario mínimo y empleo en Colombia : 1984-2000" [Estimation of the relationship between mínimum wages and employment in Colombia: 1984-2000], *Revista de Economía del Rosario,* Vol. 6/2, pp. 117-138.

Herr, H. and M. Kazandziska (2011), "Principles of minimum wage policy – Economics, institutions and recommendations", *ILO Working Paper*, No.11.

Hertz, T. (2005) "The effect of minimum wages on the employment and earnings of South Africa's domestic service workers", *Upjohn Institute Working Papers*, No. 05-120, Kalamazoo, MI: W.E. Upjohn Institute for Employment Research.

Holz, C.A. (2014), "Wage determination in China during reform period", *BOFIT Discussion Paper*, No. 13/2014, Helsinki.

Huang, Y., P. Loungani, and G. Wang (2014), "Minimum wages and firm employment: Evidence from China", *IMF Working Paper*, Vol. 14/184.

ILO (n.d.), "Performance of labour inspection systems, selected countries", [online], available: http://www.ilo.org/wcmsp5/groups/public/---ed_dialogue/---lab_admin/documents/resourcelist/wcms_160321.pdf. Accessed 25 November 2014.

ILO (2003), *Guidelines Concerning a Statistical Definition of Informal Employment*, ILO, Geneva.

ILO (2010), "Figures and statistics on labour inspection systems", [online], available: http://www.ilo.org/labadmin/info/WCMS_141079/lang--en/index.htm. Accessed 25 November 2014.

ILO (2011), "Sex-disaggregated data on labour inspectors, selected countries", [online], available: http://www.ilo.org/labadmin/info/WCMS_160319/lang--en/index.htm. Accessed 25 November 2014

ILO (2012), *Statistical Update on Employment in the Informal Economy*, ILO Department of Statistics, Geneva.

ILO (2013), "Brazil", [online], available: http://www.ilo.org/labadmin/info/WCMS_114935/lang--en/index.htm. Accessed 25 November 2014

Infante, R., A. Marinakis and J. Velasco (2003), "Minimum wage in Chile: An example of the potential and limitations of this policy instrument", *ILO employment paper*, No. 2003/52.

Islam, I. and S. Nazara (2000), "Minimum wage and the welfare of Indonesian workers", *ILO Occasional Discussion Paper Series*, No. 3, Jakarta.

Jales, H. (2014), "Estimating the effects of the minimum wage in a developing country: A density continuity approach", *Canadian Labour Market and Skills Researcher Network Working Paper*, No. 142.

Jann, B. (2005), "DEVCON: Stata module to apply the deviation contrast to transform estimation results", *Statistical Software Components*, S450603, Boston College Department of Economics, revised 31 July 2006.

Jia, P. (2014), "Employment and working hour effects of minimum wage increase: Evidence from China", *China & World Economy*, Vol. 22/2, pp. 61-80.

Joumard, I. and J. L. Vélez (2013), "Income inequality and poverty in Colombia - Part 1. The role of the labour market", *OECD Economics Department Working Papers*, No. 1036, OECD Publishing.

Kanbur, R., L. Ronconi and L. Wedenoja (2013), "Labour law violations in Chile", *International Labour Review*, Vol. 152/3-4.

Kapelyuk, S. (2014), "Impact of minimum wage on income distribution and poverty in Russia", *EERC Working Paper*, No. 14/03.

Kobzar, E. (2009), "Минимальная заработная плата и региональные рынки труда в России" [Minimum wage and regional labour markets in Russia], *Moscow State University Working paper*, No. WP15/2009/06.

Korkmaz, A., and O. Coban (2006), "Emek piyasasinda asgari ucret, issizlik ve enflasyon arasindaki iliskilerin ekonometrik bir analizi: Turkiye ornegi (1969-2006)" [An econometric analysis of the relation between minimum wages, inflation and unemployment: the case of Turkey (1969-2006)], *Maliye Dergis*, No.151, pp. 16-22.

Kristensen, N. and W. Cunningham (2006), "Do minimum wages in Latin America and the Caribbean matter? Evidence from 19 countries", *World Bank Policy Research Working Paper*, No. 3870.

Lee, S. and K. Sobeck (2012), "Low-wage work: A global perspective", *International Labour Review*, Vol. 151/3, pp. 141-155.

Lemos, S. (2009a), "Minimum wage effects in a developing country", *Labour Economics*, Vol. 16/2, pp. 224-237.

Lemos S. (2009b), "Comparing employment estimates using different minimum wage variables: The case of Brazil", *International Review of Applied Economics*, Vol. 23/4, pp. 405-425.

Lemos, S. (2007), "Minimum wage effects across the private and public sectors in Brazil", *Journal of Development Studies*, Vol. 43/4, pp. 700-720.

Lemos, S. (2005a), "Political variables as instruments for the minimum wage", *Contributions to Economic Analysis and Policy*, Vol. 4/1, pp. 1-31.

Lemos, S. (2005b), "Minimum wage effects on wage, employment and prices: implications for poverty alleviation in Brazil", *University of Leicester Department of Economics Working Paper*, No. 05/15.

Lemos, S. (2004a), "Minimum wage policy and employment effects: Evidence from Brazil", *Economía*, Vol. 5/1, pp. 219-266.

Lemos, S. (2004b), "A menu of minimum wage variables for evaluating wages and employment effects: Evidence from Brazil", *IZA Discussion paper series*, No. 1069.

Lemos, S. (2004c), "The effects of the minimum wage in the formal and informal sectors in Brazil", *IZA Discussion paper series*, No. 1089.

Leonard, M. de L., T.D. Stanley and H. Doucouliagos (2014), "Does the UK minimum wage reduce employment? A meta-regression analysis", *British Journal of Industrial Relations*, Vol. 52/3, pp. 499-520.

Lewinbuk, K.P. (2008), "Russia's labor pains: the slow creation of a culture of enforcement", *Fordham International Law Journal*, Vol. 32/3.

López, H. and F. Lasso (2008), *Salario Mínimo, Salario Medio y Empleo Asalariado Privado en Colombia. Un Estudio Exploratorio Sobre la Evasión al Mínimo Legal*, [Minimum wage, average wage and private wage employment in Colombia. An exploratory study on the legal minimum evasion], Barradores de Economía 2008.

Luo, R., M. Zhou and W. Wu (2011), "Impacts of minimum wage on employment of migrant workers in China", in Q. Zhou (ed.), *Advances in Applied Economics, Business and Development*, Springer.

Lustig, N. and D. McLeod (1997), "Minimum wages and poverty in developing countries: Some empirical evidence", *Brookings Discussion Papers in International Economics*, No. 125.

Magruder, J. R. (2013). "Can minimum wages cause a big push? Evidence from Indonesia", *Journal of Development Economics*, Vol. 100/1, pp. 48–62.

Maloney, W. and J. Mendez (2004), "Measuring the impact of minimum wages: Evidence from Latin America" in J.J. Heckman and C. Pagés (eds.), *Law and Employment: Lessons from Latin American and the Caribbean*, University of Chicago Press.

Martinez, C.A., G.M. Morales and P.R. Valdes (2001), "Cambios estructurales en la demanda por trabajo en Chile" [Structural changes in labour demand in Chile], *Economía Chilena*, Vol. 4/2.

Mayneris, F., S. Poncet and T. Zhang (2014), "The cleansing effect of minimum wage: Minimum wage rules, firm dynamics and aggregate productivity in China", *CEPII Working paper*, No. 2014-16.

Millea, M. J., J.P. Rezek, and J. Pitts (2012), *Minimum Wages in a Segmented Labour Market: Evidence from South Africa*, presented at the 7th Annual International Symposium on Economic Theory, Policy and Applications, 23-26 July 2012, Athens, Greece.

Miranda, J. (2013), "Labour demand stability and the minimum wage effect on employment: the Chilean evidence", *MPRA Paper*, No. 46637.

Montenegro, C.E. and C. Pagés (2004), "Who benefits from labor market regulations? Chile, 1960–1998", in J.J. Heckman and C. Pagés (eds.), *Law and Employment: Lessons from Latin American and the Caribbean*, University of Chicago Press, Chicago.

Mora Rodriguez, J.J. (2007), "El efecto del salario mínimo sobre la probabilidad de participar en la informalidad en Colombia, 2001-2005" [The impact of minimum wages on the probability of being in informal employment in Colombia, 2001-2005], presented at Quinto Simposio Nacional De Microeconomía, July 25-27, Bogota.

Moura, R. and M.C. Neri (2008), "Efetividade do salário mínimo estadual: Uma análise via regressões quantílicas para dados longitudinais" [Effectiveness of the state minimum wage: Analysis using quantile regression for longitudinal data], *Economia Aplicada*, Vol. 12/2, pp. 239-273.

Muravyev, A. and A. Oshchepkov (2013), "Minimum wages, unemployment and informality: Evidence from panel data on Russian regions", *IZA Discussion Papers*, No. 7878.

Murray, J. and C. van Walbeek (2007), "Impact of the sectoral determination for farm workers on the South African sugar industry: Case study of the KwaZulu-Natal north and south coasts", *Agrekon, Agricultural Economics Association of South Africa (AEASA)*, Vol. 46/1.

Nataraj, S., F. Perez-Arce, K.B. Kumar and S.V. Srinivasan (2014), "The impact of labor market regulation on employment in low-income countries: A meta-analysis", *Journal of Economic Surveys*, Vol. 28/3, pp. 551–572.

Neumark, D., W. Cunningham and L. Siga (2006), "The effects of the minimum wage in Brazil on the distribution of family incomes: 1996-2001", *Journal of Development Economics*, Vol. 80/1, pp. 136-159.

Neumark, D., J.M. Ian Salas and W. Wascher (forthcoming), "Revisiting the minimum wage-employment debate: Throwing out the baby with the bathwater?" *Industrial and Labor Relations Review*.

Neumark, D., J.M. Ian Salas and W. Wascher (2014), "More on recent evidence on the effects of minimum wages in the United States", *NBER Working Papers*, No. 20619.

Ni, J., G. Wang and X. Yao (2011), "Impact of minimum wages on employment: Evidence from China", *The Chinese Economy*, Vol. 44/1, pp. 18-38.

OECD (2007). *Taxing Wages 2005/2006*, OECD Publishing, Paris.

OECD (2008). *Employment Outlook 2008*, OECD Publishing, Paris.

OECD (2011), *Reviews of Labour Market and Social Policies: Russian Federation*, OECD Publishing, Paris.

OECD (2012), *Indonesia Economic Surveys: Overview*, OECD Publishing, Paris.

OECD (2013), *OECD Economic Surveys, Colombia*, OECD Publishing, Paris.

Ozturk, O. (2006), "Employment effects of minimum wages in inflexible labor markets", *MPRA paper*, No. 16233.

Papps, K. L. (2012), "The effects of social security taxes and minimum wages on employment: Evidence from Turkey", *Industrial and Labor Relations Review*, Vol. 65/3, pp. 686-707.

Paredes, R.M. and L.C. Riveros (1989), "Sesgo de selección y el efecto de los salaries mínimos" [Selection bias and the effect of mínimum wages], *Cuadernos de Economia*, Vol. 26/79, pp. 367-383.

Paredes, R.M. and L.C. Riveros (1993), "El rol de las regulaciones en el mercado laboral: el caso de Chile" [The role of labour market regulations: the case of Chile], *Estudios de Economía*, Vol. 20/1, pp. 41-67.

Pelek, S. (2011), "The employment effect of the minimum wage on youth labour market in Turkey: A regional panel data analysis", Paper presented at 2011 IIPPE Annual Conference.

Pelek, S. (2013), "The impact of the minimum wage on the wage distribution: evidence from Turkey", *Giam working paper*, No. 13-08.

Pratomo D. S. (2014), "Does minimum wage affect hours worked of paid employment in Indonesia?", *International Journal of Social Economics*, Vol. 41/5, pp. 362-379.

Rama, M. (2001), "The consequences of doubling the minimum wage: The case of Indonesia", *Industrial and Labor Relations Review*, Vol. 54/4, pp. 864-881.

Rani, U., P. Belser, M. Oelz and S. Ranjbar (2013), "Minimum wage coverage and compliance in developing countries", *International Labour Review*, Vol.152/3-4.

Republic of South Africa (2014), "Sectoral determination", [Online], available: www.labour.gov.za/DOL/legislation/sectoral-determinations/sectoral-determination. Accessed 30 October 2014.

Reutersward, A. (2005), "Labour protection in China: Challenges facing labour offices and social insurance", *OECD Social, Employment and Migration Working Papers*, No. 30, Paris

Romero Gudiño, A. (2008), "Inspección federal del trabajo en México" [Federal labor inspection in Mexico], *Revista Latinoamericana de Derecho Social*, No. 6, pp. 113-143.

Saget, C. (2008), "Fixing minimum wage levels in developing countries: Common failures and remedies", *International Labour Review*, Vol. 147/1, pp. 25-42.

Saget, C. (2006), "Wage fixing in the informal economy: evidence from Brazil, India, Indonesia and South-Africa", *ILO Conditions of Work and Employment Series*, No. 16.

Samaniego De Villarreal, N. and R. Samaniego Breach (1988), "Evaluation of the impact of minimum wages on the Mexican economy", *ILO Labour-Management Relations Series*, No. 67.

Sánchez, F., V. Duque and M. Ruiz (2009), "Costos laborales y no laborales y su impacto sobre el desempleo, la duración del desempleo y la informalidad en Colombia, 1980-2007" [Labour and non-labour costs and their impact on unemployment, unemployment duration and informality in Colombia, 1980-2007], *Universidad de los Andes, Documentos CEDE*, No. 11.

Santoso, B. and K. H. Hassan (2013), *Enforcing the Minimum Wage Through Criminal Sanctions: A Case of Indonesia*, Labour Law Research & GreDTiSS.

Schmitt, J. (2013), *Why Does the Minimum Wage Have no Discernable Effect on Employment?*, Center for Economic and Policy Research, Washington DC.

Shi, J. (2011). "Employment effect of minimum wage in China – Research based on construction and manufacturing", in Q. Zhou (ed.), *Advances in Applied Economics, Business and Development*, Springer.

Solimano, A. (1988), "El impacto macroeconómico de los salarios mínimos en Chile" [The macroeconomic impact of mínimum wages in Chile], *Revista de análisis económico*, Vol. 3/1.

Soundararajan, V. (2014), "Minimum wage effects at different enforcement levels: Evidence from employment surveys in India", *The Charles H. Dyson School of Applied Economics and Management Working Paper*, No. 2014-12.

SSA (n.d.), "Social security programmes throughout the world", [online], available: http://www.ssa.gov/policy/docs/progdesc/ssptw/. Accessed 27 November 2014.

Stanley, T.D. and H. Doucouliagos (2012), *Meta-Regression Analysis in Economics and Business*, Routledge.

Stanley, T.D. and S.B. Jarrell (1989), "Meta-regression analysis: A quantitative method of literature surveys", *Journal of Economic Surveys*, Vol. 3/2.

Suryahadi, A., W. Widyanti, D. Perwira and S. Sumarto (2003), "Minimum wage policy and its impact on employment in the urban formal sector", *Bulletin of Indonesian Economic Studies*, Vol.39/1, pp. 29-50.

Téllez, J. and J. C. Suárez (2011), *Economic Observatory – Colombia*, BBVA Group Research Department.

Tunali, I. (2004), "Background study on labour market and employment in Turkey", *European Training Foundation Report*.

Velásquez, M. (2014), "Chile: El incumplimiento en un contexto de alza sostenida del mínimo" [Chile: Non-compliance in the context of sustained minimum wages growth], in Marinakis A. (ed.) , *Incumplimiento con el salario mínimo en América Latina: El peso de los factores económicos e institucionales* [Non-compliance with minimum wages in Latin America: The importance of economic and institutional factors], OIT, Santiago.

Wang, J. and M. Gunderson (2011), "Minimum wage impacts in China: Estimates from a prespecified research design, 2000-2007", *Contemporary Economic Policy*, Vol. 29/3, pp.392-406.

Wang, J. and M. Gunderson (2012), "Minimum wage effects on employment and wages: dif-in-dif estimates from eastern China", *International Journal of Manpower*, Vol. 33/8, pp. 860-876.

Wedenoja, L. (2013), "The employment and wage effects of minimum wages in a context of informality and non-compliance", Paper presented at the Meeting of the Society of Labor Economists in Arlington, Virginia, May 2-3 2014.

World Bank (2008), "Minimum wages in developing countries: Helping or hurting the poor?" *World Bank Employment Policy Primer*, No. 10.

World Bank (2013), *China 2030: Building a Modern, Harmonious and Creative Society, Washington*, World Bank, Washington DC, and the Development Research Center of the State Council, the People's Republic of China.

Xiao, X-Y., and B-L. Xiang (2009), "The impact of minimum wage policy on wages and employment in China", *Proceedings of the 2009 International Conference on Information Management, Innovation Management and Industrial Engineering*, Vol. 2, pp. 102-105.

Acknowledgements

The authors are grateful for comments on earlier drafts of this paper received from Andrea Garnero, Veerle Miranda and Catherine Saget. All remaining errors are the exclusive responsibility of the authors.

Annex A: Country Minimum Wage Systems

Brazil

Type

The minimum wage was established in Brazil in 1934, but only came into force in July 1940. The minimum wage was included in the Consolidated Labour Code (*Consolidação das Leis do Trabalho* – CLT) in 1943 and, in 1963, extended to cover rural areas. Initially the minimum wage varied by state and sub-region, but it was turned into a single national minimum wage in 1984 (later consolidated by the 1988 Constitution). Since 2000, however, states have been allowed to set their own minimum wage again[22] as long as it is superior to the national minimum wage. Five states have introduced such wage floors, which vary also by occupational group: Rio de Janeiro in 2000; Rio Grande do Sul in 2001; Paraná in 2006; São Paulo in 2007 and Santa Catarina in 2009.

Value

On January 1st 2014, the Brazilian minimum wage was uprated to BRL 724 per month (approximately USD 336)[23]. A daily and hourly minimum wage are set for non-fulltime workers. In 2013, the value of the national minimum wage in Brazil was estimated to be set at 45.4% of average wages and 71.4% of median wages (see Figure 2). People who earn the minimum wage are exempt from income tax. However, high non-wage costs in Brazil mean that the actual cost to employers of hiring a minimum wage worker is almost double the value of the minimum wage.

Coverage

The minimum wage in Brazil applies to all workers, occupations, sectors and regions. While declining, informality is still relatively common in Brazil and stood at an estimated 38.0% in 2013 (Foguel and de Melo Costa, 2014). But many workers in the informal sector earn at or above the minimum wage. Broecke and Vandeweyer (forthcoming) have estimated that in 2013, 21.6% of all workers in Brazil earned less than the minimum wage.

Minimum wage setting

The minimum wage in Brazil is set by the Government (Executive Power) and established by decree. The minimum wage adjustments are annual and, in recent years, have been specified for several years in advance. The rule (specified in law) for uprating the minimum wage specifies that increases should be equal to the rate of inflation plus the rate of real GDP growth rate. The validity of this law ends in 2015. Regional minimum wage floors are fixed by the state governor and approved by the legislative assembly. While consultations with social partners are not required by law in Brazil, in practice these do often occur. The current rule for uprating the minimum wage, for example, was agreed upon after consultation with the unions.

Enforcement

If non-compliance with the national minimum wage and/or state wage floor is detected, a penalty of BRL 52 000 is imposed (approximately USD 24 118), which is doubled in case of a second infringement of the law (ILO Travail database). According to Benassi (2011), employers who violate labour standards are also excluded from obtaining public and private credits.

Chile

Type

The first minimum wage law was introduced in Chile in 1934. It covered only a limited set of sectors and the minimum wage level was different for each sector. In 1973, the minimum wage system was adjusted as to have only one national minimum wage, covering all private sectors. There is no regional, sector or occupational variation in the Chilean minimum wage today. The only variation, which was introduced in 1989, concerns the age of the worker: workers younger than 18 or older than 65 get a lower minimum wage, which equals about 75% of the normal minimum wage. Until 2011, domestic workers also received a lower minimum wage.

Value

The current minimum wage, valid since July 1st 2014, equals CLP 225 000 per month (approximately USD 454). This minimum wage refers to a 45-hour work week, but it can be adjusted according to the number of hours worked per week. The minimum wage is a gross wage: about 23% of the wage will go to social security contributions, compulsory health insurance and unemployment insurance (Grau and Landerretche, 2011). The minimum wage for workers younger than 18 or older than 65 currently amounts to CLP 167 968 per month (approximately USD 339). In 2013, the value of the national minimum wage in Chile was estimated to be set at 69% of average wages.

Coverage

All private sector workers, with the exception of apprentices and workers with mental disorders, are covered by the minimum wage legislation. In the period 1990-2009 more than 18% of covered workers were paid below the minimum wage level (Kanbur *et al*., 2013), but this share dropped to 8.9% by 2011 (Velásquez, 2014). A large share of the Chilean labour force also works without contract and is therefore not covered by labour laws. In 2011, 32% of workers, mainly self-employed, were not covered by minimum wage laws (Velásquez, 2014).

Minimum wage setting

The government sets the minimum wage at its own initiative and is not required to consult or negotiate with the social partners. Nonetheless, in practice, employer and worker representatives are involved. The minimum wage legislation does not specify how or when to revise the minimum wage. Generally, however, the minimum wage is revised annually (in July) and inflation and productivity growth are taken into account. In the most recent revision, the date and size of the adjustment for the next two years (2015 and 2016) were already determined.

Enforcement

Inspectors can impose fines when minimum wage law infringements are detected. No fines are imposed when the employer makes up for the detected underpayment within three days of detection (ILO, 2014). Paying a salary below the minimum wage is considered to be a very serious violation of the labour code. The fines vary according to firm size and range from CLP 422 200 to 2 533 200 per worker (approximately from USD 852 to USD 5 115)[24] (*Departamento de inspección*, 2014).

China

Type

Although China approved the ILO's Minimum Wage-Fixing Machinery Convention in 1984, its states were only required to implement guaranteed minimum wages from 1994 onward. In 2004, the minimum wage law was revised considerably, primarily to extend its coverage and to establish rules concerning minimum wage revisions. According to China's Labour Law, the provincial, autonomous-region and municipal governments are allowed to set their own local minimum wage, which all employers are required to comply with. A monthly minimum wage is set for full-time workers, i.e. those working 40 hours per week, while an hourly wage is set for the remaining workers.

Value

Currently, monthly minimum wages in China range from CNY 830 (around USD 134) in certain cities in Guangxi (since July 2013) to CNY 1 820 (around USD 294) in Shanghai (since April 1st 2014). This applies to full-time workers working 40 hours per week. The relative minimum wage, i.e. the minimum wage as a share of the average wage, dropped from 40% in 1995 (Jia, 2014) to about 30% in 2011. In its Urban Employment Growth plan for 2011-2015, the Chinese government stated that local governments should raise their minimum wages by 13 percent annually as to have minimum wages reach 40% of average local wages by 2015. After a minimum wage freeze in 2008 (as a result of the global financial crisis), minimum wages rose, in nominal terms, on average by 21.2% in 2011, by 20.2% in 2012 and by 16.9% in 2013 (Holz, 2014).

Coverage

After coverage was extended in 2004, the Chinese minimum wage regulations now cover all workers, on the condition that "labour is provided within the promissory working hours or within the working hours as prescribed in the labour contracts". It is important to note that despite the attempts to make minimum wage enforcement stricter, there is still a substantial share of workers who remain uncovered. The incidence of non-compliance is higher for the youngest and oldest workers, as well as for female, migrant workers and low-skilled workers. In 2005, for example, 84.4% of migrant full-time workers and 21.1% of migrant part-time workers were paid at least the minimum wage, compared to 85% and 44.6% of local workers (Du and Pan, 2009). In urban China, the share of informal employment was about 32% in 2010 (ILO, 2012).

Minimum wage setting

Local governments are required to revise the minimum wage at least once every two years. The minimum wage is set jointly by the local government, trade unions, and enterprise confederations. A draft is then submitted to the Ministry of Labour and Social Security for review, which considers the opinions from the All China Federation of Trade Unions and the China Enterprise Confederation before passing the proposed new minimum wage programme. For the determination of the local minimum wage, governments have to take into account the minimum living standards of employees and their dependants, the local average wages of workers and staff, social insurance contributions paid by employees, labour productivity, the urban economic situation and the level of economic development. As a guideline, the 2004 minimum wage law stated that the minimum wage should be between 40% and 60% of the local average wage. Since the mid-2000s, the Labor and Social Security Ministry has requested provinces on several occasions to raise their minimum wages in a timely manner, giving criteria for the revision to be based on. The most recent minimum wage adjustments have focused on following local economic development and the price level (Holz, 2014).

Enforcement

The competent departments of the local governments are empowered to make supervisions and inspections on the implementation of the minimum wage standards. While conducting supervisions and inspections, these departments are entitled to check related materials concerning labour and collective contracts and to conduct on-site inspections at workplaces. Employing units and labourers should provide material and information, based on the facts, to the competent labour department. In addition, trade unions may supervise the implementation, and report violations, of the minimum wage legislation. The 2004 law increased the penalties for non-compliance from 20% to 100% of the owed wage to 100% to 500%.

Colombia

Type

Minimum wages were introduced in Colombia in 1955. Until 1984, minimum wages varied between rural and urban regions and by firm size. In 1984, a unified national wage floor was introduced (Arango and Pachón, 2004). Sub-minimum wages exist for trainees with no university degree, set at 75% of the national minimum wage (Joumard and Vélez, 2013).

Value

As of 1st January 2014, the monthly minimum wage equalled COP 616 000 per month (around USD 330) (for a workweek regime of 48 hours) - (Baker and McKenzie, 2014). Part-time workers get a minimum wage proportional to their monthly hours worked (Código Sustantivo del Trabajo, Art. 147). In Colombia, minimum wage earners are not exempted from paying income taxes and social security contributions. However, since the introduction of the Formalisation and Job Creation Law of December 2010, employers can deduct some payroll taxes – equal to 11.5% of the wage bill until the tax reform of December 2012 and 6.5% afterwards – of new employees earning less than 1.5 times the minimum wage from their income tax for a maximum of two years. In 2013, the value of the national minimum wage in Colombia was estimated to be set at 71.62% of average wages.

Coverage

All workers in the private sector are covered by the minimum wage legislation (ILO Travail legal database). In 2006, 29.9% of paid workers received a wage below the minimum wage (López and Lasso, 2008). About 59.6% of workers in Colombia worked in the informal sector in 2010 (ILO, 2012). About two-third of informal workers in Colombia earn below the minimum wage (Joumard and Vélez, 2013).

Minimum wage setting

The minimum wage is set by the Permanent Commission on the Harmonisation of Wage and Labour Policies (*Comisión Permanente sobre la Armonización de Políticas Salariales y Laborales*) through an Executive Decree. If the Commission cannot reach a consensus by the end of the year, the government fixes the minimum wage. The Commission is a tripartite institution made up of five government representatives, five workers' representatives and five employers' representatives (Joumard and Vélez, 2013; ILO, Travail legal database; Téllez and Suárez, 2011). The minimum wage is meant to "assure a decent quality of life for the worker and for his family at the material, moral and cultural level." By law, the minimum wage is updated every year to reflect: the cost of living of each region; the contribution of wages to GDP; national productivity; the economic capacity of employers; and the inflation rate (ILO, Travail legal database).

Enforcement

The Special Unit for Labour Inspection, Vigilance and Control (*Unidad Especial de Inspección, Vigilancia y Control de Trabajo*) executes measures of prevention, inspection, monitoring and control in the whole territory of the country, with the aim of ensuring compliance with labour legislation in the private and public sectors. Failure to comply with labour legislation results in fines of between one and one hundred times the current minimum wage rate depending on the seriousness of the offence (ILO, Travail legal database).

India

Type

India introduced a Minimum Wage Act in 1948 to enable national and local governments to set and revise minimum wages for a specific set of employment categories. These employment categories are referred to as 'scheduled employments' and consist of unorganised, non-unionised industries with limited bargaining power. This minimum wage is set at the regional level and is allowed to differ between sectors and occupations. A region can only include an activity in the list of 'scheduled employments' if it has over 1 000 employees engaged in that activity. The number of 'scheduled employments' was originally set at 13, but now varies considerably between the regions, ranging from one in Mizoram to 104 in Assam, with a total of 372 defined types (Government of India, 2012). For state-owned enterprises and firms in the mining and railway sectors the minimum wage is set by the national government rather than by the regional governments. Different minimum wages may be set for young workers and apprentices. Piece-rate workers also have their own minimum wages, while disabled workers are excluded from the minimum wage regulations. As a consequence of the significant regional variation and the fact that minimum wage rates may vary across occupations and ages, there are over 1 000 minimum wage rates in India (Belser and Rani, 2010). In order to reduce the regional disparities in minimum wage levels, a non-binding national wage floor was introduced in 1996, whose value is established by the central government and revised at irregular intervals.

Value

The national minimum wage equalled INR 137 per day from July 1st 2013 (approximately USD 2). Minimum wages are set on hourly, daily and monthly bases. The daily minimum wage is based on an 8-hour working day, while the monthly minimum wage is based on 26 working days per month. In 2012, the value of the minimum wage in India was estimated to be set at 37.5% of average wages.

Coverage

About 70% of all salaried workers are covered by minimum wage laws (Rani *et al*., 2013). Self-employed workers, who represent about 51% of all workers, are not covered by minimum wages (Belser and Rani, 2012). Data for 2009-2010 showed that 48.6% of all casual workers and 22.2% of all regular salaried/wage workers received a wage below the average regional minimum wage (Belser and Rani, 2012). This share was particularly high for rural workers. The rate of compliance was estimated to be around 60% in the late 2000s (Rani *et al*., 2013). In 2010, the share of informal work was estimated to be almost 84% (ILO, 2012).

Minimum wage setting

The regional governments must revise the minimum wages at intervals not exceeding five years. In general, there are two methods for fixing or revising minimum wages. Under the first method (the committee method) committees and sub-committees are set up by the appropriate governments to give

advice on setting minimum wages. The second method (the notification method) consists of government proposals being published in the Official Gazette for information of the persons likely to be affected by the minimum wage changes. A date, not less than two months from the date of the notification, is fixed on which the proposals will be taken into consideration. After considering the advice of the (sub-)committees and all the representations received by the specified date, the appropriate government revises the minimum wage by notification in the Official Gazette, and the revision comes into force three months after the date of its issue. The committees consist of representatives of employers, employees and independent persons.[25] The level of the minimum wage should ensure the minimum human needs of an industrial worker.[26] In order to reduce the regional disparities in minimum wage levels, the states are requested to determine minimum wages rates through regional committees (Eastern, North Eastern, Southern, Northern and Western regions). The national wage floor is determined by the central government based on changes in the Consumer Price Index. This national minimum wage has been revised at irregular intervals.

Enforcement

The enforcement of the Minimum Wages Act is secured at two levels. While at the central level the enforcement is secured through the Inspecting Officers of the Chief Labour Commissioner, compliance at the regional level is ensured through the State Enforcement Machinery. They conduct regular inspections and, in the event of detection of non-payment or under-payment of minimum wages, they advise the employers to pay the shortfall in wages. In case of further non-compliance, the employer is liable either for a prison term not exceeding six months, a fine not exceeding INR 500 (around USD 9), or both. The level of the fine has not been adjusted since the drafting of the minimum wage act in 1948. An amendment to raise the fine to INR 5 000 (around USD 90) has been proposed and is in the process of being reviewed. Enforcement is weak due to poor human resource capacity and low availability of funds in the state labour departments (Saget, 2006; Soundararajan, 2014).

Indonesia

Type

Minimum wages in Indonesia have existed since the 1970s (Chun and Khor, 2010; Del Caprio *et al*., 2012). Rather than a single national minimum wage, Indonesia has provincial or regency based minimum wages as well as sector minimum wages. Under no circumstances may the latter be lower than the former. Each of the 33 regions in Indonesia is autonomous, with the Governor having the power to revise minimum wages on annual basis. Many provinces have set a basic minimum wage which applies to all sectors. However, provinces are also entitled to set separate minimum wages for each sector on the basis of agreements between corporate organisations and worker unions/labour federations. Several provinces have set sector minimum wages for agriculture, mining, manufacturing, utilities, forestry and rubber ware industries among others (ILO Travail legal database).

Value

On average, the minimum wage in Indonesia was IDR 1 126 622 per month in 2013 (around USD 108).[27] In general, the minimum wage laws are intended to cover formal sector workers who work 40 hours per week (Chun and Khor, 2010). However, most industries, particularly in the manufacturing sector, are likely to apply 48 hours per week as the normal working hours for their workers (Pratomo, 2014). In 2013, the value of the minimum wage in Indonesia was estimated to be set at 62.7% of average wages.

Relative to average wages, Indonesia has one of the highest minimum wages in the world (OECD, 2012). In 2013, the minimum wage equalled 62% of the average wage of salaried workers, although the situation varies somewhat across provinces.

Coverage

Formally, minimum wages apply only to workers/labourers with less than a year's service, as wages of workers employed for more than one year are negotiated between employer and worker's unions (Saget, 2006; Santoso and Hassan, 2013). Only workers employed by businesses are protected by minimum wage laws. As such, all people working for other kinds of employer are excluded (e.g. domestic workers). In 2012 the number of workers who earned wages above the minimum wage was only 37% of the total workers in Indonesia, while the other 63% were only paid at or below the minimum wage (Santoso and Hassan, 2013). Rani *et al.* (2013) estimate that 50% of all covered workers receive wages at least equal the minimum wage. It was estimated that informal employment accounted for 62.2% of total employment in Indonesia in 2012 (OECD, 2012).

Minimum wage setting

Minimum wages in Indonesia are set annually (Santoso and Hassan, 2013) by Governors after considering recommendations provided in the National Government's wage policy. For the purposes of establishing the National Government's wage policy and providing recommendations to the provincial Governors, a National Wage Council, Provincial Wage Councils and District Wage Councils are established. These Wage Councils have representatives from the government, employer organisations, trade/ labour unions, universities and experts as their members. The ratio of government representatives, trade union/labour representatives and employer organisation representatives is set at 2:1:1 and the number of members from universities and experts is adjusted to need. The total number of members always has to be odd. Each Wage Council meets at least once every three months and reports to its relevant government at least once a year (ILO, Travail legal database). Minimum wages should be set so as to take into account the needs of workers and their families, and the cost of living. In order to set the minimum wage, consideration is also given to: the level of economic development and per capita income; the condition of the labour market; corporate capability, development and sustainability; the homogeneity of companies; the number of companies; the number of workers; the foreign exchange generated; associations of companies and relevant workers' associations (ILO, Travail legal database).

Enforcement

Failure to pay the relevant stipulated minimum wage can be penalised with a maximum fine of IDR 100 million (approximately USD 9 559). A judge may also direct that the outstanding wages should be paid to the worker concerned. Failure to pay the relevant stipulated minimum wage can be penalised with a maximum prison term of three months (ILO travail legal database). However, the legislation provides for exceptions to be made for companies who are not in a position to pay the minimum wage. An application for postponement must be made and an agreement must be reached between employers and employees. Approval for any postponement that must be given by governors cannot exceed 12 months (ILO travail legal database). When the postponement ends, the employer is under an obligation to pay minimum wages but it is not obliged to make up the difference between the actual wages paid and the applicable minimum wages during the period of postponement (Santoso and Hassan, 2013).

Mexico

Type

In Mexico, the first minimum wage law was created in 1931. Until 1962, minimum wages were set at the municipal level by municipal committees. The 1962 reform of minimum wages introduced regional committees for the determination of the minimum wage. The reform also introduced minimum wages at the occupational level. In 1986 the regional committees were abolished and from then on minimum wages

would be determined at the national level, though different minimum wages for different economic zones remained. Over the years the number of professions and economic zones for which individual minimum wages had to be set decreased. Currently, the National Committee on Minimum Wages sets minimum wages for 2 zones (zone "A" for mainly urban areas in Mexico and zone "B" for rural areas) and 59 occupations. Other than the regional and occupational differences, there is no variation in minimum wage levels. The minimum wage is determined on a daily basis, assuming an 8-hour workday. People working less than 8 hours a day get a proportional minimum wage (Bosch and Manacorda, 2010).

Value

The value of minimum wage since January 1st 2014 has been MXN 67.29 per day (approximately USD 5.27) in economic zone "A", and MXN 63.77 (almost USD 5) in economic zone "B". In the former zone, the professional minimum wages range from MXN 83.97 (around USD 7) to MXN 201.58 (around USD 16), and in the latter from MXN 79.71 (around USD 6) to MXN 190.77 (around USD 15) (Comisión Nacional de los Salarios Mínimos data). As a result of Mexico's generous tax credit for low-wage earners, full-time minimum wage workers face a negative tax burden (OECD, 2007). In 2013 the Mexican minimum wage equalled 28.3% of the average wage.

Coverage

The Mexican minimum wage law covers all workers. Non-compliance is low, with a compliance rate of about 90% in the late 2000s (Rani *et al*., 2013). In 2009 the share of informal employment was 53.7% (ILO, 2012).

Minimum wage setting

The National Commission on Minimum Wages is a tripartite institution made up of representatives from the government, employers and workers. Special boards may be appointed to provide advice. The minimum wage levels are adjusted annually, although they can be revised at any time if the economic circumstances urge a revision. When revising the minimum wage level, several economic and social factors are taken into account. The main criteria the National Commission looks at are: the budget that a family may require to cover material needs, variations in the cost of living per family, the conditions of the labour market and wage levels, the country's overall economic situation, the conditions of life and work, and inflation. In addition, the Committee considers investigations, studies and suggestions made by the organisations of employers and workers.

Enforcement

Authorised labour inspectors may carry out inspections in order to ensure compliance with labour legislation. Fines for non-compliance with the minimum wage range from 50 to 200 times the minimum wage, depending on the severity of the infringement. These fines can be doubled in case of repeat offences. An employer may also be liable to imprisonment for between six months and four years.

Russian Federation

Type

Minimum wage legislation was established in the Russian Federation in 1976. Until 2007, there was one single minimum wage throughout the country, although in practice there was some regional variation because of the application of mandatory regional coefficients.[28] In 2007, the minimum wage law was revised to give regions the autonomy to set their own minimum wages, as long as they are not lower than the national minimum wage determined by the federal government.

Value

On January 1st 2014, the national minimum wage was raised to RUB 5 554 per month (approximately USD 174), based on a 40-hour work week. Regional minimum wages are highest in Moscow, reaching RUB 12 600 per month (approximately USD 396) (January 2014). Until 2008, the minimum wage was lower than 10% of the average Russian wage. However, because of significant (both nominal and real) minimum wage hikes, the relative minimum wage reached almost 25% of average wages in 2009 (OECD, 2011). However, by 2013, this ratio dropped back again to 18.4%.

Coverage

The Russian federal minimum wage covers all workers. In some regions, minimum wages are set only for the private sector, while entities financed from regional and municipal budgets are exempted from these agreements. The Labour Code gives employers a right to withdraw from a regional minimum wage agreement, as long as this is done in written form within 30 days after the publication of the relevant regional law.

Minimum wage setting

The Labour Code does not specify the consultation process to be followed when the federal government sets or adjusts minimum wage rates, however it does provide for social partnership. Regional minimum wages are set following consideration of the opinion of the Regional Tripartite Commissions of the Regulation of Labour and Social Relations, which consists of regional labour unions, employers' associations and government. Again, it is not compulsory for the regions to negotiate their minimum wage with social partners. Indexation has been held on a discretionary basis with no regularity in the recommendations of the government. According to the law, the minimum wage should exceed the minimum subsistence level calculated on the basis of the minimum consumption basket for a working-age individual. However, the minimum wage has never met this criterion and the Russian government seems to take the norm as a long-term goal (Bolsheva, 2012). In 2011, the minimum wage was only 68% of the minimum subsistence level.

Enforcement

Labour inspectors and trade unions are responsible for ensuring that the provisions of the Labour Code concerning the national minimum wage are adhered to. Inspectors may enter workplaces and inspect the records and documents necessary to ensure compliance. The Labour Code does not set forth the penalties to be applied in the event that employees are not paid the national minimum wage rate. State Labour Inspectors may charge employers with binding directives in order to eliminate infringements of the Labour Code, carry out disciplinary measures and refer cases to the relevant court. Additionally, an employee has the right to take the case to court in order to recover the unpaid wages. Lewinbuk (2008) argues that the Russian Federation generally fails to comply with and enforce its labour regulations.

South Africa

Type

The first minimum wage laws in South Africa only date back to 1999, when a minimum wage for the contract cleaning sector was introduced (Bhorat *et al*., 2014). Today, minimum wages are in place in eleven sectors which are considered to have the most vulnerable workers: contract cleaning; civil engineering; learnerships; domestic workers; children (under 15 years) in the performance of advertising, artistic and cultural activities; private security; wholesale and retail; taxi; forestry; farm workers; and hospitality. Within each sector minimum wages are allowed to vary by occupation, region, experience,

firm size and weekly hours worked (Republic of South Africa, 2014). As such, the South African minimum wage system is very complicated, with many different minimum wage levels. Aside from these sector minimum wages, many workers are covered by a minimum wages through collective bargaining by public and private sector bargaining councils. Sector minimum wages may not be applied to workers already covered by a collective agreement within a bargaining council. Independent contractors, members of the National Defence Force, the National Intelligence Agency and the South African Secret Service, and unpaid volunteers working for an organisation with a charitable purpose are never bound by minimum wage legislation (Republic of South Africa, 2002).

Value

The hourly minimum wages in South Africa range between 8.3 ZAR (approximately 0.75 USD), for domestic workers, and 56.08 ZAR (approximately 5.2 USD), for civil engineers in 2014. In 2013, the value of the minimum wage in South Africa was estimated to be set at 17% of average wages.[29] In 2007, two-thirds of workers covered by sector minimum wages were living in poverty (Coleman, 2013).

Coverage

In the late 2000s, about 74% of all workers were legally covered by minimum wage legislation (Rani *et al*., 2013). Non-compliance is very high, with 45% of workers covered by minimum wage legislation earning below the minimum wage in 2007 (Bhorat *et al*., 2012). The estimated share of persons in informal employment amounted to 32.7% in 2010 (ILO, 2012).

Minimum wage setting

The minimum wage is set by the Minister of Labour following recommendations from the Employment Conditions Commission. This commission is composed of one workers' representative and one employers' representative, government representatives and three independent persons, who are appointed by the Minister of Labour following consultation with the National Economic Development and Labour Council. In its advice, the commission takes several criteria into account: poverty alleviation, cost of living, wage differentials, inequality, the likely impact of the minimum wage on employment, the capacity of employers to pay, the possible impact on the operation of small, medium or micro-enterprises and new enterprises, and the possible impact on the health, safety and welfare of the employees (Republic of South Africa, 2002). There is no general rule on the frequency of minimum wage updates. Often minimum wages are set for multiple years, with different levels per (half) year.

Enforcement

Compliance is promoted, monitored and enforced by giving advice to employees and employers on their rights and obligations, conducting inspections, and investigating complaints made to a labour inspector. When workers are paid below the minimum wage, fines can be imposed. Depending on the amount of previous violations, these fines range from 25% to 200% of the amount due to the worker (Basic Conditions of Employment Amendment Act, No 11 of 2002).

Turkey

Type

In 1974, a nation-wide minimum wage was introduced in Turkey, which was set at a lower level for agriculture and forestry workers. This differentiation between sectors was abolished in 1989 (Tunali, 2004). Today, Turkey therefore has only one minimum wage. Until 2014, young workers (less than 16 years old) received a minimum wage of about 85% of the adult minimum wage. At the start of 2014,

however, minimum wages were equalised for all age groups. Special minimum wage rates are set for apprentices, equalling about 30% of the normal minimum wage.

Value

For the first half of 2014 the gross minimum wage was set at TRY 1 071 per month (approximately USD 563), while for the second half it was set at TRY 1 134 (approximately USD 596) (CSGB, 2014). This minimum wage is based on a 45-hour work week. The after-tax value of the current minimum wage is TRY 891.03 (approximately USD 468) (CSGB, 2014). In 2006, the Turkish tax burden on minimum wages was the highest among OECD countries (OECD, 2007). In 2012, the Turkish minimum wage was about 37.4% of the average wage and 72.5% of the median wage.

Coverage

All workers working under an employment contract are covered by minimum wage legislation (Labour Act of Turkey, Law N. 4857). Of all covered workers, around 50% earned a wage below the minimum wage in the late 2000s (Rani *et al*., 2013). According to the ILO (2012), around 30.6% of workers were informally employed in 2009. The size of the informal sector has risen steadily over the years (OECD, 2008).

Minimum wage setting

Minimum wages are set by the Minimum Wage Fixing Board consisting of five government representatives, five employees' representatives and five employers' representatives. The board meets with at least ten members present and decides by majority vote (Labour Act of Turkey, Law N. 4857). The Turkish Labour Act states that the goal of minimum wages is to regulate the economic and social conditions of workers. Aside from these conditions, the economic situation and inflation have been taken into account when fixing minimum wages (ILO travail). Minimum wages are required to be adjusted at least every two years, but in practice adjustments are bi-annual.

Enforcement

The Ministry of Labour and Social Security is responsible for ensuring proper compliance with all labour laws. Their officials are allowed to enter workplaces at any time in order to carry out inspections. According to the Labour Act (article 102) a fine of TRY 300 (almost USD 160) can be imposed on an employer of every employee and every month if he/she fails to pay the minimum wage.

Annex B: Minimum, average and median wages – definitions and sources

The calculation of minimum, average and median wages used in Figure 1 builds to a large extent on the ILO Global Wage Report definitions.

Brazil

- Minimum wage: national monthly minimum wage (*Pesquisa Mensal de Emprego*).
- Average/median wage: gross usual monthly earnings from main job, all regions (*Pesquisa Nacional por Amostra de Domicílios*).

Chile

- Minimum wage: national monthly minimum wage for people aged 18 to 65 (*Ley Chile*).
- Average wage: gross average monthly wage, all workers except those working in agriculture, hunting and forestry; fishing; defence activities, maintenance of public order and safety; private households with domestic service; and extraterritorial organisations and bodies (INE, *Encuesta sobre costos de la mano de obra y remuneraciones*).
- Median wage: net wage for all workers (OECD, based on *Encuesta de Caracterización Socioeconómica Nacional*).

China

- Minimum wage: weighted average of regional monthly minimum wages (the highest minimum wage is used for each region).[30] Employment in urban units is used for weighting (secondary sources + National Bureau of Statistics China).
- Average wage: gross average wage of employed persons in urban units (National Bureau of Statistics China).

Colombia

- Minimum wage: national monthly minimum wage (*Banco de la Republica*).
- Average/median wage: gross monthly labour income, all regions (*Gran Encuesta Integrada de Hogares*).

India

- Minimum wage: national floor level minimum wage, daily level multiplied by 6*52/12 (Government of India, Ministry of Labour and Employment).
- Average wage: gross average wage of manufacturing workers (Government of India, Ministry of Statistics and Programme Implementation).

Indonesia

- Minimum wage: employment-weighted average of provincial minimum wages (Statistics Indonesia, Statistical Yearbook).

- Average wage: average monthly nominal wage of production workers below supervisory level in the manufacturing industry (Statistics Indonesia, Statistical Yearbook).

Mexico

- Minimum wage: employment-weighted average minimum wage, daily level multiplied by 26 (*Comisión nacional de los salarios mínimos*).

- Average wage: average wage, hourly level multiplied by average hours worked per week times 52/12 (*Encuesta Nacional de Ocupacion y Empleo*).

- Median wage: median wage, hourly level multiplied by median hours worked per week times 52/12 (*Encuesta Nacional de Ocupacion y Empleo*).

Russian Federation

- Minimum wage: national monthly minimum wage (secondary sources).

- Average wage: average monthly nominal wage (Interstate Statistical Committee of the Commonwealth of Independent States, CIS STAT).

South Africa

- Minimum wage: minimum wage of general assistants in the wholesale and retail sector in Area A (South Africa Department of Labour). This sector was chosen because it is the largest of all covered sectors (DPRU, 2008).

- Average wage: average gross monthly wage paid to employees in the formal non-agricultural sector (Statistics South Africa).

Turkey

- Minimum wage: national minimum wage (Eurostat).

- Average/median wage: average monthly earnings of full-year workers (2013 Industrial Gross Wages Index of the Turkish Statistical Office applied to 2012 OECD data, based on the Structure of Earnings Survey).

Annex C: Social security contributions

Social insurance (old age, disability and survivors): In all countries (except in Chile and South Africa) employers pay social insurance for their employees. These contributions are lowest in Indonesia (4% of payroll), Mexico (7%), Turkey (11%) and Colombia (12%), and highest in the Russian Federation (22%), Brazil and China (20%), and India (18%). In Chile, although employers do not contribute to any social insurance, they pay an average of 1.26% of payroll for employees' disability and survivor insurance (plus 1% or 2% of covered earnings for employees working under arduous conditions).

Sickness and maternity insurance: In all countries (except for Brazil, Chile and South Africa) employers pay sickness and maternity insurance for their employees. Sickness and maternity insurance is a fixed rate in Colombia (8.5% of payroll) and India (4.75%). The rate varies according to employees' characteristics in other countries, notably in Indonesia, where the rate is 3% for single employees and 6% for married employees. In a number of countries (Mexico, Russian Federation and Turkey), sickness and maternity insurance is in the form of medical and cash benefits. Medical benefits account for: 20.40% of the Mexico City legal monthly minimum wage in Mexico;[31] 5.1% of payroll in the Russian Federation; and 7.5% of the monthly payroll in Turkey. Cash benefits equal 0.7% of payroll in Mexico, 2.9% in the Russian Federation and 1% to 6.5% in Turkey. In China, sickness and maternity insurance equals 1% of payroll, on top of which employers also pay a basic medical insurance equalling 6% of payroll, although the rates may vary significantly across geographic areas.

In Brazil, Chile and South Africa, employers do not pay a stand-alone sickness and maternity insurance for their employees. Sickness and maternity benefits are (at least partly) paid for by employers' social insurance in Brazil, and by employers' unemployment insurance in South Africa. In Chile, sickness and maternity benefits are financed exclusively by employees.

Work injury insurance: In all countries (except for India and Turkey) employers pay work injury insurance for their employees, the rate of which varies by industry and according to the assessed degree of risk. In India and Turkey, work injury benefits are financed by employers' sickness and maternity insurance.

Unemployment insurance: Only in a number of countries (Chile, China, Colombia, South Africa and Turkey) do employers pay separate unemployment insurance for their employees. Employers' contributions to unemployment insurance is fixed at 2% of payroll in China and Turkey; 8.3% of the insured's annual salary in Colombia; and 1% of the insured's covered earnings in South Africa. Conversely, in Chile the employers' unemployment insurance rate depends on the type and duration of the contract. It equals 2.4% of covered payroll a month for up to 11 years, and 3% if an employee has a fixed-term contract.

In Brazil, employers contribute 8% of earnings to the employee's Guarantee Fund for Severance Pay (FGTS) account. The insured may withdraw funds from an individual account in the event of unemployment, marriage, retirement, or other contingencies. In Mexico, although employers do not pay any unemployment insurance, labour law requires employers to pay dismissed employees a lump sum, the size of which will depend on the number of years of employees' contributions. In India, employers' sickness and maternity insurance also finances unemployment benefits. In Indonesia and the Russian Federation, employers do not pay any form of contribution for unemployment insurance.

Family Allowance: Only in two countries, notably Colombia and Mexico, do employers pay family allowance, which equals 4% and 1% of payroll, respectively. Family allowance is paid for by employers' social insurance in Brazil, and by employer medical benefits contributions in the Russian Federation. In Chile, China and South Africa, family allowance is financed by the government.

Annex D: Papers included in meta-analyses

	Elasticities	Signs
Arango and Pachón, 2004		x
Atalas & Cameron 2003		x
Bell (1997)	x	x
Beyer and Dusaillant (2009)		x
Bhorat et al (2013)		x
Bhorat et al (2014)		x
Broecke & Vandeweyer (forthcoming)	x	x
Carneiro (2004)		x
Castañeda (1983)		x
Chun and Khor (2010)		x
Comola and De Mello (2011)		x
Del Carpio et al (2012)	x	x
Ding (2010)		x
Dinkelman and Ranchhod (2012)		x
Fang and Lin (2013)	x	x
Feliciano (1998)	x	x
Foguel (1998)	x	x
Foguel et al (2001)		x
Garza Cantú and Cantú Bazaldúa (2002)	x	x
Grau and Landerretche (2011)		x
Gunsoy and Tekeli (2013)		x
Hernandez & Lasso (2003)		x
Hernandez Diaz and Pinzon Garcia, 2006		x
Hertz (2005)		x
Huang et al (2014)	x	x
Islam and Nazaro (2000)	x	x
Jia (2014)		x
Kobzar (2009)		x
Lemos (2004a)	x	x
Lemos (2004b)	x	x
Lemos (2004c)	x	x
Lemos (2005a)	x	x
Lemos (2005b)	x	x
Lemos (2007)	x	x
Lemos (2009a)	x	x
Lemos (2009b)	x	x
Luo et al (2011)		x
Madruger (2013)		x
Martinez et al (2001)	x	x
Mayneris et al (2014)	x	x
Milea et al (2012)		x
Miranda (2013)	x	x
Montenegro and Pages (2004)	x	x
Neumark et al (2006)		x
Ni et al (2011)	x	x
Ozturk (2009)		x
Papps (2012)		x
Pelek (2011)		x
Rama (2001)		x
Samaniego de Villareal and Samaniego Breach (1998)		x
Shi (2011)	x	x
Soares (2005)		x
Solimano (1988)		x
Suryahadi et al (2003)	x	x
Wang and Gudnerson (2011)	x	x
Wang and Gudnerson (2012)		x
Xiao and Xiang (2009)	x	x

Annex E: Results meta-analysis, signs: Methodology controls

				(i)						(ii)			
		Negative		No		Positive		Negative		No		Positive	
Country	Brazil							-0.166**	(0.065)	0.221***	(0.071)	-0.054*	(0.032)
	Indonesia							-0.095	(0.076)	0.019	(0.087)	0.076*	(0.041)
	China							0.078	(0.065)	-0.049	(0.060)	-0.029	(0.037)
	Turkey							0.201	(0.136)	-0.206	(0.143)	0.005	(0.047)
	Chile							0.051	(0.078)	-0.194	(0.171)	0.143	(0.125)
	Mexico							0.069	(0.101)	-0.066	(0.115)	-0.003	(0.043)
	South Africa							0.032	(0.094)	-0.024	(0.127)	-0.008	(0.084
	Colombia							0.090	(0.108)	-0.112	(0.124)	0.022	(0.035)
	Russia							-0.260***	(0.059)	0.411***	(0.068)	-0.151***	(0.038)
Skills	All							0.073***	(0.025)	-0.124***	(0.027)	0.051***	(0.018)
	Low							0.073*	(0.038)	-0.051	(0.035)	-0.022	(0.022)
	Other							-0.146***	(0.028)	0.175***	(0.033)	-0.029	(0.022)
Age	All							0.035	(0.023)	-0.055*	(0.029)	0.020	(0.022)
	Young							-0.011	(0.036)	0.036	(0.031)	-0.025	(0.018)
	Other							-0.023	(0.039)	0.019	(0.042)	0.004	(0.028)
Wage	All							0.067	(0.048)	-0.155**	(0.060)	0.088***	(0.024)
	Low							-0.001	(0.042)	0.016	(0.044)	-0.015	(0.021)
	Other							-0.066	(0.049)	0.139***	(0.049)	-0.073***	(0.021)
Gender	All							-0.031	(0.042)	0.032	(0.047)	-0.002	(0.026)
	Female							0.130**	(0.061)	-0.123**	(0.054)	-0.007	(0.019)
	Male							-0.099*	(0.059)	0.091	(0.055)	0.009	(0.023)
Formality	All							0.023	(0.036)	0.049	(0.054)	-0.072	(0.056)
	Formal							0.041	(0.055)	0.029	(0.041)	-0.071	(0.056)
	Informal							-0.064	(0.067)	-0.078	(0.071)	0.143	(0.108)
Published	no							0.103***	(0.031)	-0.102***	(0.034)	-0.001	(0.020)
	yes							-0.103***	(0.031)	0.102***	(0.034)	0.001	(0.020)
Time	<1995							0.133***	(0.039)	-0.099**	(0.044)	-0.035*	(0.018)
	>=1995							-0.133***	(0.039)	0.099**	(0.044)	0.035*	(0.018)
Method	Regression	-0.089	(0.102)	0.252***	(0.073)	-0.163*	(0.096)	-0.017	(0.103)	0.149*	(0.089)	-0.132	(0.085)
	DiD	-0.087	(0.106)	0.263***	(0.090)	-0.177*	(0.101)	0.024	(0.129)	0.156	(0.121)	-0.180**	(0.090)
	Time series	0.004	(0.125)	-0.091	(0.171)	0.086	(0.124)	0.095	(0.142)	-0.156	(0.192)	0.061	(0.121)
	model	0.171	(0.270)	-0.424***	(0.061)	0.253	(0.270)	-0.103	(0.284)	-0.149	(0.137)	0.252	(0.218)
Constant		0.329***	(0.096)	0.424***	(0.061)	0.247**	(0.094)	0.139	(0.112)	0.696***	(0.110)	0.164*	(0.098)
N		*1020*		*1020*		*1020*		*1020*		*1020*		*1020*	

Source: Author's calculations based on elasticities from analysed papers.
Notes: Robust standard errors clustered at the study level, reported in parentheses. ***Significant at the 1% level, **Significant at the 5% level, *Significant at the 10% level.

[1] The countries were chosen because they were either: (i) OECD member countries; (ii) OECD key member countries; or (iii) OECD accession countries. All 10 countries are relatively large economies, which could partly drive the result of no employment effect. Indeed, the employment effects of minimum wages might be expected to be larger in small, open economies. The results therefore apply only to large emerging economies, and this should be born in mind when interpreting the findings.

[2] Informal employment is defined as all persons whose main job lacks basic social or legal protection or employment benefits (ILO, 2003).

[3] No official estimates on informal employment are available for the Russian Federation, so the estimate provided in Table 1 refers only to persons employed in the informal sector. The informal sector covers individuals working in units that have informal characteristics in relation to, for example, the legal status, registration, size, the registration of the employees, their bookkeeping practices, etc. Of the emerging countries, the Russian Federation had the smallest informal sector (12.1% for the period 2005-2010) followed by South Africa (17.8% in 2010) - ILO (2012). Accordingly, unofficial estimates of the incidence of informal employment in the Russian Federation are low (Charmes, 2012).

[4] In this paper, employers' social security contributions (SSCs) refer to social insurance (old age, disability and survivors), as defined in SSA (n.d.). On the top of social insurance, however, employers may face additional costs for hiring workers, notably contributions for sickness and maternity insurance, work injury insurance, unemployment insurance and family allowances. As a consequence, total costs to employers might be considerably higher than the employers' SSCs indicated in the text. In Chile and South Africa, for example, although they employers do not pay social insurance, employers but they do contribute to work injury insurance and unemployment insurance (although total costs to employers remain low). As another example, iIn Colombia and Mexico, the total cost of hiring for employers is significantly higher than the SSCs indicated in the text would suggest (see Annex x for an overview of the cost of hiring).

[5] Although this says nothing about the size of the underpayment – another measure of the extent of non-compliance.

[6] The Chinese share of workers earning below the minimum wage refers to the total working population, i.e. people in both formal and informal employment. The compliance rate can therefore be seen as a lower-bound on actual compliance.

[7] In the Russian Federation, the legal framework seeks to improve compliance rather than penalise non-compliance. The Labour Code does not set forth the penalties to be applied in the event that employees are not paid the national minimum wage. However, State Labour Inspectors may charge employers with binding directives in order to eliminate infringements of the Labour Code, carry out disciplinary measures and refer cases to the relevant court. In addition, an employee has the right to take the case to court in order to recover the unpaid wages.

[8] The authors have calculated the number of labour inspectors per 1 000 employed people using different data sources. The data source for the number of labour inspectors for Brazil is: ILO (2013); for Chile and Mexico: Romero Gudiño (2008); for China: Reutersward (2005); For Colombia: Department of Labor (2014); for India: Soundararajan (2014); for Indonesia: ILO (2011); for Russian Federation: OECD (2011); for South Africa: ILO (n.d.); for Turkey: (ILO, 2010). The source for data on employment is the OECD Statistics Database for all countries except for Indonesia, for which the data source is the ILO database.

[9] It is important to note that no universal definition of the informal sector is used across studies. Some authors define the informal sector as all self-employed workers (Chun and Khor, 2010; and Magruder, 2013), while others explicitly exclude this category (Wedenoja, 2013; Lemos, 2009a). Other definitions include: (i) not having a signed labour card (Carneiro and Corseuil, 2001; Lemos, 2009a; Wedenjoa, 2013); (ii) not having a written contract (Bhorat, 2014; Dinkelman and Ranchhod, 2012); or (iii) not being registered in the social security system (Pelek, 2011). To be able to assess and compare the impact of minimum wages on

informality it is important to use a common definition, such as the one used and agreed on by the International Labour Organization (ILO, 2003). Because of data limitations, however, studies may not always be able to apply this definition.

[10] One exception was a study by Carneiro and Corseuil (2001) who look at the period between 1982 and 1999 and use a difference-in-differences model. They find much larger negative employment effects, ranging between -3% and -13% for a 10% increase in the minimum wage.

[11] Again, one exception is Jales (2014), who is unique in using PNAD data (2001-2009), and finds that unemployment is around 10%-22% higher in Brazil than it would have been in the absence of the minimum wage. While this seems large, it is difficult to directly compare these results with those obtained in the previous literature because of the very different methodology employed

[12] According Del Carpio *et al*. (2012), production workers are workers who work directly in the production process, such as forklift operators, whereas non-production workers perform supporting tasks, such as administration.

[13] See Annex D for the list of studies included in the coefficient meta-analysis.

[14] For a number of countries, these findings therefore point in different directions than the qualitative literature review. However, this may not be entirely surprising since the focus is now on the sub-set of studies that report elasticities.

[15] While the definition of low-skilled differs somewhat between papers, this category includes: less educated, unskilled or people with incomplete high school.

[16] The definition of young people differs between papers, but tends to cover people aged 15-29.

[17] The definition of low-wage workers differs between papers, e.g. low-wage, below the minimum wage, between one and two time the minimum wage.

[18] Where studies span more than one year, the average year of the study is calculated and included as a control variable in the meta-analysis.

[19] In practice, this is achieved using the Stata module *devcon* written by Jann (2005).

[20] A result is said to be significant when it is significantly different from zero at the 5% level. However, a few studies only provided significance at the 10% level, and these were also included.

[21] See Annex D for the list of studies included in the sign meta-analysis.

[22] Technically, the term "minimum wage" in Brazil is reserved for the national minimum wage, and state minimum wages should be referred to as "wage floors" (*piso salarial*).

[23] Values in USD throughout the text are calculated using the USD exchange rate (period-average) for 2013 (OECD National Accounts Statistics/Aggregate National Accounts, http://dx.doi.org/10.1787/na-ana-data-en).

[24] Fines are set in terms of *Unidades Tributarias Mensuales* (UTM), which are adjusted monthly and equalled CLP 42 220 in August 2014. Non-compliance with minimum wage laws results in fines that range between UTM 10 and UTM 60.

[25] The Minimum Wage Act does not give details on who these independent persons should be. In practice, they are often government officials.

[26] These minimum human needs are based on food, clothes and housing requirements, as well as on expenditure on items such as fuel, children's education and minimum recreation.

[27] However, for daily or part-time workers minimum wages can be calculated on a per-hour basis.

[28] According to the Russian Labour Law, public workers in some remote areas are eligible for additional remuneration, which is determined by regional coefficients.

[29] Because of the complexity of the South African minimum wage system, it is not possible to calculate an average minimum wage. The Kaitz index is therefore based on the minimum wage in one specific sector, see Annex 1 for details.

[30] Most Chinese regions have multiple minimum wages, the highest of which apply in big cities. For the region of Guangdong, the average of the Guangzhou and Shenzhen minimum wages is used.

[31] Plus 1.1% of covered earnings greater than three times the legal monthly minimum wage in Mexico City.