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Extending the coverage of minimum wages in India: Simulations from household data

Patrick Belser
Uma Rani

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Preface

Minimum wages are an important tool for social justice.

The importance of minimum wages as an instrument of social protection was already highlighted in the ILO Constitution, adopted in 1919 as part of the Treaty of Versailles after World War I. The preamble of the Constitution recalls that "the High Contracting Parties, moved by sentiments of justice and humanity as well as by the desire to secure permanent peace" called for "the provision of an adequate living wage" alongside other urgent measures to improve the conditions of labour.

The international community's recognition of the important social role of minimum wages was reiterated in the ILO *Declaration of Philadelphia* in 1944, the ILO *Declaration on Social Justice for a Fair Globalization* in 2008, and the Global Jobs Pact adopted at the ILO in June 2009. The two ILO Conventions – the Minimum Wage-Fixing Machinery Convention, 1928 (No. 26), and the Minimum Wage Fixing Convention, 1970 (No. 131) – further highlight the importance of this policy instrument in achieving fairness and social progress.

Yet, while minimum wages are nearly universal (with the significant exception of many Gulf countries), there remain large differences across countries in their design, coverage, levels and implementation. These differences reflect national preferences as well as different traditions.

The present working paper discusses minimum wages in India, seeking to make a constructive contribution to an ongoing national debate and relying also on experience and example from other countries. Specifically, the paper simulates the impact of extending the coverage of minimum wages on poverty, inequality and the gender pay gap. In one of the most striking results, the paper shows that if all wage-earners were covered by the state-level minimum wages at existing levels, the earnings of up to 76 million low-paid wage-earners – out of about 400 million workers – could be directly affected.

Such findings illustrate the huge potential of minimum wages to ensure that everyone receives a just share of the fruits of national progress. At the same time, the results also highlight the critical importance of sound and empirically-based minimum wage setting, which should involve social partners, independent national experts, and which should take into consideration both the needs of workers and their families as well as economic factors.

Manuela Tomei,
Chief,
Conditions of Work and Employment Programme,
Social Protection Sector.

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This paper represents the views of the authors and not necessarily those of the ILO.

Contents

Abstract

In India, there is a debate about the possible extension of minimum wages to all wage-earners. Our paper provides some benchmark figures on the effects of either making the national minimum wage floor compulsory or extending the coverage of state-level minimum wages. Using the 2004/05 Employment-Unemployment Survey along with the Consumer Expenditure Survey, we estimate that the extension of minimum wages at existing levels could improve the earnings of up to 76 million low-paid salaried and casual workers. Depending on assumptions about effects on days worked, we estimate that perfect compliance would reduce the Gini coefficient of wage inequality by 5 to 9 percentage points and the probability of casual wage-earners to live in poverty by 5 per cent to 8 per cent. The gender wage gap among casual workers would fall from 16 per cent to 8 per cent. This suggests that an extension of minimum wages could have large effects, even under imperfect compliance.

Introduction

During the decades before the global economic crisis, the Indian economy expanded at a rate of 5.5 per cent to 6.0 per cent per annum. These high rates of economic growth are often believed to be the result of a series of reforms towards freer markets that began in 1991 (World Bank, 2007), ignoring the fact that high growth rates were also achieved in the preceding decade. Two influential articles by Rodrik and Subramanian (2005) and Kohli (2006) describe how the change in the Government's attitude towards the private sector, the relaxation of industrial licensing and the erosion of the exclusive monopolies of the public sector accelerated economic growth in the 1980s already. These changes paved the way for external liberalization a decade later, in particular the liberalization of the country's capital account, with opening up to foreign investment, significant reduction in tariff barriers, and the dismantling of quantitative restrictions (Das, 2003).

Economic growth in India, and the boom in information technology and other related services, brought about a structural transformation, in particular a decline in the share of agriculture in GDP, from almost 36 per cent in 1986-87 to about 20 per cent in 2006-07, limited expansion in the share of industry and a substantial rise in the share of services sector – which now accounts for more than 50 per cent of GDP (GoI, 2009a). This divergence in the 1990s from the Kuznet's historical pattern – which assumes a transition from agriculture first to manufacturing and only later into services – is not peculiar to India and can be observed in other developing countries (Dasgupta and Singh, 2005). Yet, in spite of a significant increase in employment in the construction and services sectors over the past two decades, large proportions (54.6 per cent) of the workforce still continue to be dependent on agriculture for their livelihoods (Mazumdar and Sarkar, 2008).

It is often hoped that returns of economic growth would eventually lead to improving the quality of working conditions in the form of improved wages (Van der Hoeven, 2001). However, despite some positive changes, India's pattern of economic growth has been associated with continuously high levels of inequality and poverty. The income inequality (Gini coefficients) in the past decade has increased in urban India by 3.6 percentage points and in rural India by 1.3 percentage points (Rani, 2008). While the top 20 per cent of both the urban and the rural population succeeded in increasing their consumption levels, there was stagnation among the vast majority and hence an increase in inequality (Sen and Himanshu, 2005; Ravallion and Datt, 2002). This reflects, at least in part, a growing gap between the wages of skilled and unskilled workers as well as an increase in geographic inequality, as measured by the diverging average per capita consumption levels across the different states and across urban and rural areas (Deaton and Dreze, 2002). As the benefits from growth have been unequally distributed, economic development has also reduced poverty less than many had expected. Although poverty trends are somewhat contentious and based on a very low national poverty line (Patnaik, 2007), the Government of India estimates that poverty (headcount rate) has declined from 36.0 per cent in 1993-94 to 27.5 per cent in 2004-05, leaving about 302 million people under the poverty line. The World Bank's estimate – as measured by a revised benchmark of US$ 1.25 per day – establishes the poverty rate at 42 per cent in 2005, equivalent to 456 million people (World Bank, 2008). These estimates are close to the poverty estimates obtained by the Tendulkar Committee (41.8 per cent for 2004-05) with a new methodology.

This scenario raises the question of whether a statutory national minimum wage could be one of the mechanisms in India to ensure that economic growth translates into less poverty and inequality. Currently, such a legally binding national minimum wage does not exist. Instead, there exist a number of compulsory state-level minimum wages for a select number of occupations, as well as a non-binding national minimum wage floor. In addition, the central government also sets some compulsory rates, mostly for state-owned enterprises. This garmented system does not convince everyone, and there seems to be a

widespread view in India on the need to improve the coherence of this system. The 40th Indian Labour Conference, held in 2005, recommended that a compulsory minimum wage be extended to all workers, not only to workers in selected occupations. Towards which the new tripartite Central Advisory Board set up in 2007, and chaired by the Minister of Labour and Employment, has agreed on the need to amend the Minimum Wages Act to make it more effective and more relevant. The Indian National Trade Union Congress (INTUC) also called for a national "decent minimum wage" in 2007 to be fixed for all industries and based on the needs of workers.

Who would benefit from such a compulsory national minimum wage and what would be the impact on poverty and inequality? What could be the potential impacts on employment if minimum wage is made compulsory? These are the main questions that we explore in the present paper. We consider two different policy options: making the national minimum wage floor compulsory across the country or, as an alternative, extending the coverage of existing state-level minimum wages to all workers. The latter option is perhaps more attractive in a huge country such as India, where the costs of living as well as economic conditions differ widely across states. At the outset, we would also clarify that we are not proposing to have a single national minimum wage floor or only state-level minimum wages. Our proposition is that there should be a national minimum wage floor or state-level minimum wages, and that no worker should be paid below the minimum wage that has been set. Other occupational wages could exist, which should be set above this basic minimum wage.

While there is a fairly large literature on the effects of minimum wages on poverty and inequality in the United States and Europe, we are not aware of many studies which simulate *ex-ante* such impacts in developing countries (a notable exception is Bird and Manning, 2008). Also, contrary to most papers on minimum wages, we look at the effects of an extension in the coverage of minimum wages and analyse the impact of an *increase* in the level of minimum wages. In fact, we do not discuss whether the existing levels of minimum wages in India are appropriate for leading a decent life. Although we are aware of the literature which considers that minimum wages in India are perhaps too low, we believe that this subject needs a separate investigation. We hope that this paper will contribute to the on-going debate and be useful for policy-makers in considering whether to expand the minimum wage coverage to all workers at the prevailing levels set in India.

The paper is structured as follows. The first section provides a brief review of the renewed debate on minimum wages and presents the global trends in minimum wages. Section II describes the relatively complex minimum wage-setting system in India and summarizes some of the debates it has generated over the years. Section III describes the methodology of our empirical investigation and presents the variables and data sources used for the analysis. Section IV discusses the results. We present some key descriptive information – the number and characteristics of the potential beneficiaries of a comprehensive minimum wage policy. We also assess, through simulations, the extent to which full compliance with the current national wage floor or with state-level minimum wages would reduce wage inequality, the gender wage gap and poverty. We also discuss the potential employment displacing effects of minimum wages. Finally, we briefly address the issues of enforcement and compliance, which are important for the effective implementation of minimum wages. Section V concludes with some policy suggestions.

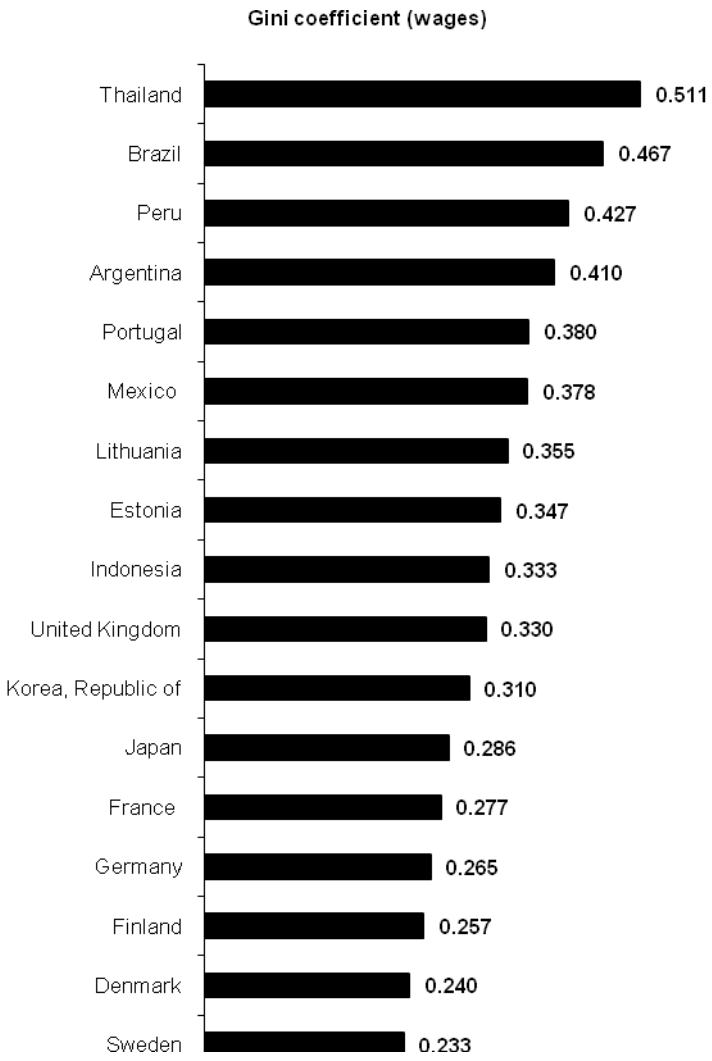
I. Revival of the minimum wage debate

After years of neglect during the 1980s and 1990s, there have recently been clear indications of a more vigorous use of minimum wage policies in both developed and developing countries (see ILO, 2008a). Perhaps most symbolic of the revival of minimum wages in developed countries is the case of the United Kingdom which, after having dismantled its system of industry-level minimum wages in the 1980s, adopted a new minimum wage with national coverage in 1999. In addition, both Ireland (2000) and Austria (2009) have introduced a national minimum wage for the first time in their history. Developing countries too are increasingly rejuvenating their minimum wage policies to provide social protection to vulnerable and unorganized/informal workers. Regional powers, such as Brazil, China and South Africa, are all among the main drivers of this trend. In China, for example, new regulations on minimum wages were issued in 2004 in the face of growing concerns about the widening wage inequality. In Brazil, the minimum wage policy was revitalized to help reverse the decline in the wages of low-paid workers. And in South Africa, minimum wage floors were newly introduced in 2002 to support the wages of millions of low-paid workers in a variety of economic sectors, including domestic workers. Globally, the ILO estimated that during the period 2001-07 more than 70 per cent of countries in the world have increased the level of their minimum wages in real terms (i.e. adjusted for inflation) (ILO, 2008a).

What explains this upward trend? The "revival" of minimum wages is probably related to various economic and social developments. Most importantly, is the fact that relatively high rates of economic growth in the late 1990s and the 2000s have been accompanied in many countries by widening inequality and stagnating real wages, especially in the lower half of the wage distribution. Income inequality increased between the early 1990s and the mid-2000s in about two-thirds of the countries for which data exists (ILO, 2008b). The Gini coefficients based on the distribution of wages (as opposed to the distribution of income) for a select number of countries from the Global Wage Database also shows a similar trend (Figure 1).[1] We see that the coefficient ranges from about 0.250 for the more egalitarian countries to figures in excess of 0.500 for the country with the most unequal distribution of wages. In light of the growing inequality, many countries, governments and social partners have tried to respond by strengthening minimum wages in order to produce outcomes that are socially more sustainable and more in tune with demands for social justice.

[1] The Global Wage Database contains information about a number of wage indicators (including average wages, minimum wages, the wage share and Gini coefficients) that are used for the analysis presented in the *Global Wage Report* (Geneva, ILO). The Global Wage Database can be consulted at www.ilo.org/travail.

Figure 1: Wage inequality (average 2004-06)



Source: ILO Global Wage Database, at www.ilo.org/travail

Another explanation for the upward trend may be the realization that standard neo-classical economics has probably somewhat overstated the adverse effects of minimum wages on employment, inflation and economic growth. Based on an assessment of the most recent academic literature, over 650 economists – including five Nobel prize winners and six past presidents of the American Economic Association – issued a statement in which they consider that higher minimum wages in the United States "can significantly improve the lives of low-income workers and their families, without the adverse effects that critics have claimed".[2] A recent ILO (2008a, pp. 44-45) publication also considers that if set at a reasonable level, minimum wages "can increase the number of workers with access to decent wages and reduce the gender pay gap with little or no adverse impact on employment levels".

One reason why the dramatic predictions of the neo-classical theories have failed to materialize in practice may have to do with the unrealistic assumptions of the models that

[2] See http://www.epi.org/publications/entry/minwagestmt2006/.

are used. The standard textbook model typically represents a labour market with two curves: the upward-sloping labour supply curve and the downward-sloping labour demand. It is assumed that when the market is allowed to work without interference, the level of wages will settle at full employment as determined by the intersection of supply and demand. In this simple model, a minimum wage set above the "market-clearing" level acts as a distortion and is responsible for the destruction of employment, the extent of which depends on the "elasticity of labour demand", i.e. the slope of the labour demand curve.

Although appealing, this simple model has been challenged on theoretical grounds almost from the start. One assumption of the model, which flows from the hypothesis that markets are best characterized by perfect competition, is that all companies are wage takers and pay wages at the marginal productivity of labour. This is probably unrealistic. According to Dolado et al. (1996), the implication that *all* workers immediately leave any firm that cuts wages by even just a fraction is "extreme and implausible". In practice, especially in countries such as India where there is widespread under-employment, many firms are able to retain workers even if the pay is low and if workers are "exploited" by being paid less than their marginal productivity. In such circumstances (known in the literature as "monopsony"), minimum wages may force firms to pay decent wages without triggering layoffs.

Another criticism against the standard model is that it is too simplistic and the predictions derived from it are applicable to single-sector markets (Fields, 1994) and do not carry to a dual labour market case, which is quite complex and most prevalent in developing countries. In a dual labour market, there is one sector where there is minimum wage coverage (formal workers) and another sector without coverage (casual workers, self-employed, home-based workers, domestic workers, etc.), and there is a possible mobility between the two. In such a case, minimum wages might not lead to increase in unemployment but result in movement from protected labour markets to unprotected labour markets. Some have argued that this movement of labour – from protected formal sector to unprotected informal sector – might dampen the wages in the latter and increase the employment in the informal sector (Harrison and Leamer, 1997; Carneiro, 2000; Maloney and Nunez, 2003). Others by contrast have argued that minimum wage increases in the formal sector would eventually lead to an increase in wages in the informal sector (Khamis, 2008). In developing countries with dual labour markets, it is highly unlikely that a minimum wage increase would lead to increase in unemployment, but rather shift in labour from one sector to another.

Another – perhaps more fundamental – criticism is linked to the partial-equilibrium nature of the neo-classical analysis. While Keynes (1936) agreed that there exists a demand schedule for labour at the industry level, which relates the quantity of employment with the level of wages (as in the neo-classical model), he considered it fallacious to transfer this reasoning without substantial modification to the economy as a whole (p. 259). The main reason is that industry-level demand can only be constructed on some assumptions about the nature of demand and supply in other industries, and that a simple transposition ignores the fact that total employment is ultimately determined by the economy-wide volume of aggregate demand (i.e. the sum of consumption, investment, net exports and government spending). Hence, the question of whether a minimum wage decreases employment necessarily depends on the effect of higher wages on aggregate demand.

What is the effect of minimum wages on aggregate demand? In practice, the minimum wage is largely a redistributive tool. On the benefit side, it increases the earnings of low-paid workers. In the short-term, this is paid for through a combination of reduced profits, lower pay for workers above the minimum wage, lower employment and increased prices. Overall, this redistribution tends to reduce inequality, which means that it redistributes resources from high-income groups to low-income groups. Because the

relatively poor have a higher propensity to spend their money than the relatively rich (see, for example, Stiglitz, 2009), this fall in inequality will then be expected to increase aggregate demand and employment. In other words, even if minimum wages force some companies to undertake layoffs in the short-term, they can be expected to ultimately lead to higher private consumption and create new jobs elsewhere in the economy (Herr, Kazandziska and Mahnkopf-Praportnik, 2009 p. 25). Judging by the recent trends in minimum wages, an increasing number of governments seem to be convinced by these general equilibrium arguments rather than the partial-equilibrium neo-classical arguments.

III. Minimum wages in India

(a) The Minimum Wage Act

India was one of the first developing countries to introduce a minimum wage policy. According to J. John (1997), the enactment of the Minimum Wages Act in 1948 was the result of both internal and external factors. Internal factors included the increase in the number of factories and wage-earners during the first half of the 20th century, as well as the growing number of industrial unrests and strikes of workers who rebelled against their "starvation wages". The most significant external factor was the adoption by the International Labour Organization (ILO) in 1928 of Article 1 of Convention No. 26 on minimum wage fixing in trades in which no effective collective bargaining takes place and where wages are exceptionally low. Until this day, the Minimum Wage Act of 1948 is still considered to be one of the most important pieces of labour legislation.

But India's system of minimum wages is also one of the most complicated in the world. The 1948 legislation determines that the "appropriate government" should fix minimum wage rates payable to employees in a number of listed (or "scheduled") employments. This has at least three important implications:

- firstly, minimum wages are set by different authorities in different types of companies;
- secondly, the minimum wage is set only "in certain employments or occupations" and so not all wage-earners are covered:
- and thirdly, there exist now a large number of rates which sometimes differ widely across states, even for the same occupation.

Thus, India has a complex system of minimum wages, which are not applicable to all workers and set up often arbitrarily by different authorities, making it difficult to monitor and enforce the innumerable minimum wages.

First, who sets the minimum wages? In practice, the "appropriate government" is either the Central Government or the state governments. More specifically, the Act provides that the Central Government sets the minimum wage rate in state-owned enterprises, while state governments set minimum wages for any other type of companies. The Central Government is also responsible for setting the minimum wage in all companies operating under a railway administration or in relation to a mine, oilfield, or major port or any corporation established by the Central Government (Article 2). The state governments and Union Territory Administration are the appropriate governments in respect of all other companies. In practice, both the Central and the state governments have appointed Advisory Boards, with the Central Advisory Board coordinating the work of all the State Advisory Boards. These Advisory Boards are usually tripartite, including representatives of government, employers and workers.

Secondly, who is covered? In the original Act, there were 13 scheduled employments (listed in Appendix I). These "employments" were considered as being the sectors uncovered by collective bargaining and therefore most vulnerable to unduly low wages and exploitation. However, as pointed out by Sankaran (1997), there is nothing in the Act to limit its application to any particular type of occupation or industry. In fact, the Act empowers "appropriate governments" to expand the list of "scheduled employment" if necessary. Over time, this has resulted in some form of inflation, to the extent that by the end of 2005, a total of 311 different types of scheduled employments for which minimum wage rates were fixed by any of the appropriate governments were in existence (see

Labour Bureau, 2005). The criterion for inclusion in the list of scheduled employment is that there should be at least 1,000 workers engaged in that activity in that state. As a result, some states have largely expanded the number of scheduled employments [such as Tamil Nadu (90) and Orissa (83)], while other states [such as Mizoram (4) and Manipur (15)] have barely expanded on the original list of 13 employments (see Labour Bureau, 2005). The increasing list of employment and occupations suggests a move towards a more inclusive coverage of workers, which is in accordance with ILO Convention No. 131, though not ratified by India. However, the proportion of workers covered through these "scheduled employments" remains unclear.

Thirdly, what is the minimum wage rate in India? There is no single answer to this question. Instead, there is a wide diversity in the number of different minimum wage rates that are set by different governments. The Minimum Wage Act itself does not determine any criteria for the determination of the minimum wage and leaves the concept 'undefined'. However, the recommendation of two important sources are usually considered while discussing minimum wages, namely (a) the conclusions of the Committee on Fair Wages [3] (1949), which recommends the elements to be taken into account when setting the "level" of minimum wages, and (b) the decisions taken at the 15th Session of the Indian Labour Conference (1957), which defined a list of basic requirements which should be taken into account. [4] Further, the Supreme Court in the historic *Raptakos Brett* [5] judgement in 1992 held that in calculating the minimum wage, the need based norms laid out in the 15th Session of the Indian Labour Conference in 1957 should be considered and specified additional components. [6]

As a result, according to the latest figures published on the website of India's Labour Bureau, [7] the Central Government sets 48 minimum wage rates for different job categories, including in agriculture, mining, oil extraction, or any corporation under its ownership, while various state governments determine minimum wage rates for 1,123 job categories among the sectors "scheduled" in the Act. Hence, there currently exist in India a total of no less than 1,171 different minimum wage rates. As already mentioned earlier, India is not an exception as other developing countries also have a number of minimum wage rates. [8]

[3] The Committee on Fair Wages clearly specified that a "minimum wage must provide not merely for the bare subsistence of life but for the preservation of the efficiency of the worker. For this purpose, the minimum wage should also provide for some measure of education, medical requirements, and amenities" (John, 1997, p. 8).

[4] The 15th Indian Labour Conference (a tripartite body comprising representation of governments, employers and labour) laid down the norms for setting up minimum wages, which included three consumption units per worker: minimum food requirements of 2,700 calories per day per "consumption unit"; cloth requirement of 72 yards per annum per family; rent allowance which is equivalent to the government's industrial housing scheme. Fuel, lighting and miscellaneous items constitute 20 per cent of the minimum wage.

[5] Workmen v. Reptakos Breet & Co. Ltd. 1992 1 LLJ 340, AIR 1992 SC 504.

[6] The additional components constituted children's education and medical recreation, including festivals, ceremonies, provision for old age and marriage.

[7] http://labourbureau.nic.in/wagetab.htm.

[8] For example, in Argentina, there are dozens of minimum wages set for agricultural workers, while one minimum wage is set for all other economic activities (Kristensen and Cunningham, 2006). In Mexico, wages are set separately for three regions and 88 occupations (Gindling and Terrell, 2004). In Costa Rica, there were over 500 wages set by industry and occupational categories; from 1988 to

(b) Towards a national minimum wage?

India's complicated system of minimum wages has generated substantial criticism and debate. The major criticism points towards the lack of coherence resulting from this complex system of minimum wages; and that it is applicable only to certain employments and does not include all workers. Ghose (1997, p. 698), for example, considers that "there is no justifiable basis for specifying different minimum wages for different types of activities so long as they all employ unskilled casual labour". In his view, a system that results in "a plethora of statutory minimum wages, all arbitrarily set, which vary across jobs within a state and across states in the same job" is simply "indefensible" (p. 697). A second area of criticism is linked to the difficulty to enforce such a complex and numerous set of minimum wage rates. A number of observers have argued that India does not have the administrative capacity to monitor and enforce all these different minimum wages.

The Bhoothlingam Committee [9] in 1978 had already proposed the idea of an absolute national minimum wage, "irrespective of sectors, regions or states below which no employment would be permitted". State governments would remain free, however, to set their minimum wages above the absolute minimum. This idea resonated with a considerable number of policy-makers and researchers. Ghose (1997, p. 698), for example, added his voice to those who would prefer a national minimum wage and proposed "a daily minimum wage [10] for unskilled labour, irrespective of the job or the sector in which it is employed and irrespective of the age or the sex of the supplier of unskilled labour".

One step in this direction was made when the Central Government introduced the concept of a "national floor level minimum wage" in 1996, which is to be revised every year. The original level of Rs. 33 per day was calculated by reference to the works of the National Commission on Rural Labour, which defined in 1991 the minimum wage as a minimum subsistence wage, which must be paid to workers by all employers on socio-economic considerations. It was argued that if the worker was paid below the minimum wage, his efficiency would suffer and, as a result, productivity would decline. The poverty line estimates were utilized for determining the minimum wages. However, to this day, the national minimum floor wage does not have any statutory backing, which means that while the Central Government can prescribe a national floor level, it is not binding on the states. Trade unions have pointed out that with this weak instrument, the Central Government can only play an "advocacy role". It remains up to state governments to be persuaded to fix minimum wages such that in none of the scheduled employments, the minimum is less than the national floor.

Another step to foster some more uniformity was the Central Government's request that the states determine minimum wage rates through consultations within five regional committees (for the eastern, north-eastern, southern, northern and western regions). However, there is still some lack of clarity with regard to concepts, norms and parameters of wage fixation at the state level. The Second National Commission on Labour (2002) also recommended that the wages should not be fixed separately for each scheduled

1999, the structure of minimum wages was simplified and gradually reduced to 19 minimum wages based on skills (El-Hamidi and Terrell, 2004). See also Marinakis and Velasco (2006).

[9] The Government of India set up a study group on Wages, Income and Prices, which was popularly known as the Bhoothlingam Committee.

[10] Ghose proposes that a minimum wage should be so defined as to ensure that each member of the household of an unskilled casual labourer has a consumption level equivalent to the national poverty line. This would mean that MW = P(1 + ned)/wemp, where MW: minimum wage; P: poverty line expenditure per person per month; ned: number of non-earning dependants per worker; wemp: number of days of wage employment that a casual labourer is likely to find in a month.

employment as was being followed. The Central Advisory Board constituted a Working Group in 2003 to look into concepts, norms and parameters of wage fixation. This Working Group arrived at Rs. 66 [11] as the national minimum wage floor, and recommended that this wage would replace the different state-level minimum wages for all different schedules of employment. This national minimum wage floor fixed by the Government of India was made effective from February 2004, but it had no legal backup (GoI, 2007).

[11] To arrive at the national minimum wage floor, the working group considered the principles laid down in the ILC of 1957 and the 1992 Supreme Court judgement. The Group then used the NSS 50th Round Consumption Expenditure Survey to calculate the minimum wage.

IV. Methodology and data

In light of these debates, it is important to understand what would happen if the national minimum floor wage was made compulsory, or if the mandatory state-level minimum wages were extended to all workers instead of covering only workers in "scheduled" employment. More precisely, whose wages would increase and by how much could inequality and poverty be reduced? We provide some elements of a response by simulating these effects.

First, we provide some descriptive statistics on the proportion of wage-earners[12] in India who earn less than the national minimum floor wage. We consider that these are the workers who would benefit from the extension of a mandatory minimum wage. We also provide some information on the characteristics of workers whose wages are below either the national minimum wage floor or the state-level minimum wages. To do this, we employ the following simple bivariate probit model for the population in the age group 15-64 years.

$$MW_i = \alpha_0 + \beta_1(E_i) + \beta_2(H_i) + \varepsilon_i \quad (1)$$

The dependent variable in the model MW indicates whether a worker receives the minimum wage (either national minimum wage floor or statutory state-level minimum wage) and is a binary variable taking the value '1' if the worker is paid below the minimum wage and '0' otherwise. E refers to a number of employment characteristics of each worker (age, experience, sex, education levels, occupation and industry categories, and size of the firm), and H refers to household characteristics of the worker (caste, region).

Second, we simulate the possible effects of a national mandatory minimum wage and of extended state-level minimum wages on wage inequality. The wage distributions of workers engaged in regular salaried and casual wage employment are examined together into one category. The wage dispersion or inequality for wage workers is measured using Gini coefficients. The Gini coefficient varies between zero (indicating no inequality) and one and is defined as follows:

$$Gini = \frac{1}{2n^2\varpi}\sum_{i=1}^{n}\sum_{j=1}^{n}\left| w_i - w_j \right| \quad (2)$$

where n is the number of individuals in the sample, w is the arithmetic mean wage, w_i is the income of individual i, and w_j is the income of individual j.

Thirdly, we simulate the poverty-reducing effect of a national mandatory minimum wage and of extended state-level minimum wages. An advantage of using the binary model is that income and expenditure distribution data typically contain non-eligible errors (Gaiha, 1988). The problem is especially severe as income accrues individually, but expenses and poverty are measured at the household level. The use of per capita expenditure as the dependent variable therefore infers a precision, which cannot be taken as granted. In such cases, it can be safer to analyze the probability of expenditure falling within a specified interval. For these reasons, we focus on probit models and explore whether extending minimum wages reduces the probability of the household to be poor. We estimate the equation of the form:

[12] Wage-earners include both those who are covered and entitled under a specific schedule of employment and those who are not covered under any schedule of employment.

$$P_i = \alpha_0 + \beta_1(MW_i) + \beta_2(X_i) + \beta_3(H_i) + \varepsilon_i \quad (3)$$

where the dependent variable P_i is whether a worker is in a household below poverty line or not, and it is a binary variable. The explanatory variables include a dummy variable for minimum wage MW_i, that indicates whether a worker is paid below the minimum wage or not. Other explanatory variables include the vector X_i of individual specific human capital variables (age, age-squared, gender, dummies for education, industry and occupation categories, size of the firm); and H_i includes the household specific variables (region, caste).

Although the effects on prices are generally argued to be of a small magnitude,[13] Ghose (1997) points out that in the case of agriculture, procurement prices fixed by the government are based on production costs, including wage costs. We recognize that this could lead to more substantial effects on prices, if the extension of minimum wages is not accompanied by some reform in the system of procurement. We also assume that mandatory minimum wages would raise the wages of all workers currently paid below that level. This would lead to an increase in the demand for goods and services produced, especially those produced by the self-employed, who comprise more than half of the workforce. However, in reality the market in goods and services of low-paid workers is actually competitive and not oligopolistic, which might actually restrict such a price rise. Our simulations should be viewed as upper limits on the extent to which such a policy instrument may change inequality or poverty, or which could be the maximum potential benefits of minimum wages.

Finally, we simulate how our results would be affected by adverse employment effects of different magnitude. This is particularly difficult in light of the wide range of estimates and lack of consensus about the overall effects of minimum wages on employment. Based on our reading of the literature, we assume two different elasticities of labour demand and apply them to our simulations. In our simulations, we assume that higher labour costs reduce the number of days worked by minimum wage workers, and therefore also reduces to some extent the ability of the minimum wage to reduce poverty and inequality.

Simulating the possible effects of a national mandatory minimum wage on wage inequality, assuming employment effects of different magnitude is a straightforward exercise. We assume that the number of days worked by minimum wage workers is reduced by an amount that depends on the elasticity of labour demand and compute the new Gini coefficients. For simulating the effects on poverty, the ideal method would be to impute the extension of minimum wages to all salaried and casual workers into income data. One could then re-estimate the new poverty rates and run simulations with different employment effects. However, for this analysis, we use monthly per capita consumer expenditure as a proxy for income, and we therefore assume that the number of days worked has reduced and then simulate the poverty-reducing effect of an extended mandatory minimum wage.

Data and variables

To run our simulations we use the Employment-Unemployment Survey along with the Consumer Expenditure Survey undertaken by the National Sample Survey Organisation (NSSO), which cover all the major Indian states. Although these surveys are

[13] See Lemos, 2004, for an international survey of the literature; Dube, Naidu and Reich, 2007, for a case study.

undertaken every five years, we use one single round corresponding to the year 2004/2005. The Employment-Unemployment Survey provides information on the characteristics of all household members (including sex, age, caste, educational level) as well as on the number of days worked and wages of both casual and salaried workers.[14] The Consumer Expenditure Survey provides – for the same households – the monthly per capita consumption expenditure, which we use as a proxy for income to classify households into below and above poverty line. We use both the national and state level poverty lines for the analysis.

The Employment-Unemployment Survey allows us to classify individuals into different categories depending on their levels of education[15] and their status in employment. Regarding the latter, the data allows for three major categories: self-employed, salaried and casual labour. The self-employed comprises own-account workers, employers and unpaid family workers, while salaried and casual workers are two separate categories of wage-earners. Salaried workers include regular salaried and wage employees, while casual workers often work on a daily basis. The survey also provides information on number of workers in the enterprise and we have used this information to construct the firm size variable. We distinguish between tiny firms (less than six workers), small firms (six to nine workers), medium firms (ten to 20 workers) and large firms (more than 20 workers).

To facilitate the analysis, we also aggregate the three-digit occupation groups classified under NOC (National Occupation Classification) into seven occupation categories and aggregate the five-digit industry groups classified under NIC (National Industrial Classification) into six industry groups with similar qualitative characteristics (see Table 1). The service sector categorization is based on capital and skill requirements. We define low productive services as sectors that are largely low-skilled, whereas high productive services comprise of modern skills and capital-intensive services (for more details, see the note at the bottom of Table 1).

Finally, we use two minimum wage indicators: one is the minimum wage set at the national level (national minimum wage floor); and the other is the minimum wage set at the state level. Though there are a number of minimum wages for different occupational categories differing across regions, we use the average minimum wages at the state level and national minimum floor wage with no variation across economic activities or occupations. For 2004-05, the national minimum wage floor was set at Rs. 66 per day, while the state-level minimum wages that we have used are provided in Appendix II. Table 1 presents a list of variable names, definitions and data sources to be included for estimation. The only selection criterion is age, and we have included all persons aged 15-64 years in the sample.

[14] The survey provides daily wages for casual workers and monthly incomes for salaried workers.

[15] We use five categories: illiterate; literate to primary; middle; secondary and higher secondary; and graduation and above.

Table 1: Variable names, definition and data source

Variable name	Definition	Data source
Age	Age of the individual	Raw data from Employment-Unemployment Survey CD, 2004-5, NSSO
Age squared	Square of age	
Caste groups	Reference group: Forward Caste	
Scheduled castes	Dummy variable for an individual belonging to a schedules caste family	
Scheduled tribes	Dummy variable for an individual belonging to a schedules tribe family	
Other backward castes	Dummy variable for an individual belonging to an Other backward caste family	
Female	Dummy variable for female worker	
Urban	Dummy variable for an individual living in urban area	
Education Groups	Reference group: Above secondary school	
Illiterate	Dummy variable for an individual having reported being illiterate	
Literate	Dummy variable for an individual not having attended school but reporting being literate	
Primary school	Dummy variable for an individual having attended primary school	
Middle school	Dummy variable for an individual having attended middle school	
Secondary school	Dummy variable for an individual having attended secondary school	
Industry groups	Reference group: Mining, electricity, gas and water	
Agriculture	Dummy variable for an individual working in agriculture sector	
Manufacturing	Dummy variable for an individual working in manufacturing sector	
Construction	Dummy variable for an individual working in construction sector	
Low-skilled services	Dummy variable for an individual working in low skilled services sector	
High-skilled services	Dummy variable for an individual working in high-skilled services sector	
Occupation groups	Reference group: Professionals	
Administration	Dummy variable for an individual working in administration	
Clerical	Dummy variable for an individual working as a clerical worker	
Sales	Dummy variable for an individual working as sales worker	
Service workers	Dummy variable for an individual working as a service worker	
Farmer	Dummy variable for an individual working as a farmer	
Production workers	Dummy variable for an individual working as a production worker	
Firm size	Reference group: Large enterprises	
Tiny	Dummy variable for workers working in enterprises with less than 6 workers	
Small	Dummy variable for workers working in enterprises with 6 to 9 workers	
Medium	Dummy variable for workers working in enterprises with 10 and above, but less than 20 workers	
MW model 1	Dummy variable for a worker earning below the national minimum wage floor (Rs.66 per day)	
MW model 2	Dummy variable for a worker earning below the statutory state-level minimum wage	
National poverty	Dummy variable for a worker living in a household which is below the national poverty line	
State poverty	Dummy variable for a worker living in a household which is below the state-level poverty line	

Note: Low-skilled services comprise trade, hotels and restaurants, transport, and personal services; high-skilled services comprise banking and insurance, communication and storage, real estate, business services and public administration.

V. Results

(a) The beneficiaries

Who and how many workers could potentially benefit from extending mandatory minimum wages? By definition, minimum wages can only apply to wage-earners, i.e. people in paid employment. So we first provide some information on the total number of wage-earners in India. In Table 2, we see that there are about 400 million persons employed in India, out of which 56.8 per cent (227 million) are self-employed. This leaves a total of 173 million wage-earners (43.2 per cent), out of which 57 million (14.3 per cent) are salaried workers and 116 million (28.9 per cent) are casual workers. Amongst all wage-earners, a majority of two-thirds are male and another majority of two-thirds live in rural areas. Those wage-earners in rural areas are mainly casual workers, while a majority of salaried workers are found in urban areas.

Table 2: Employment by activity status, all India 2004-05

	Male	Female	Total
Rural			
Self-employed	58.1	63.7	60.2
Salaried	9.0	3.7	7.1
Casual labour	32.9	32.6	32.8
Total	198,605,700	112,859,300	311,462,800
Urban			
Self-employed	44.8	47.7	45.4
Salaried	40.6	35.6	39.5
Casual labour	14.6	16.7	15.0
Total	70,025,200	19,201,300	89,301,100
All			
Self-employed	54.6	61.2	56.8
Salaried	17.2	8.4	14.3
Casual labour	28.1	30.3	28.9
Total (in 2000)	268,282,800	132,191,300	400,658,900

Source: Computed from the raw data provided by the National Sample Survey Organisation, Employment-Unemployment Survey, 2004-05.

Not all wage-earners are paid the minimum wage. Overall, no less than 73 million workers, equivalent to 42 per cent of all wage-earners, receive wages which are below the national minimum wage floor of Rs. 66 per day in 2004-05. This includes more than half of all casual workers (58.6 million earners) and another one-fourth of all salaried workers (or 14.5 million workers). Unsurprisingly, female workers and those residing in rural areas are more likely to earn below minimum wages (see Table 3). Of course, the national minimum wage floor is only indicative. Therefore we also looked at the state-level minimum wages. We found a similar result: 76 million workers are paid less than the minimum wages, including 27.2 per cent of salaried workers and 52.3 per cent of casual workers. These high proportions may result from a variety of reasons, but presumably include a large number of workers in "schedules" that are not-covered by the minimum wage legislation.

Table 3: Proportion of workers below minimum wage pay, all India

	Male	Female	Total
National minimum wage floor			
Salaried workers			
Rural	27.4	50.1	31.6
Urban	17.9	36.0	21.3
Total	21.5	41.3	25.3
Casual workers			
Rural	55.0	45.9	51.9
Urban	38.0	50.7	40.8
Total	52.7	46.3	50.6
State-level minimum wages			
Salaried workers			
Rural	22.2	42.2	25.7
Urban	24.9	40.6	28.2
Total	23.8	41.2	27.2
Casual workers			
Rural	55.2	47.4	52.7
Urban	49.7	54.9	50.8
Total	53.7	48.7	52.3

Note: The national minimum wage is Rs. 66 per day for 2004 and the state-level minimum wages are provided in Appendix II.

Source: Computed from the raw data provided by the National Sample Survey Organisation, Employment-Unemployment Survey, 2004-05.

Who is paid below the minimum wage, i.e. who would benefit from enforcing mandatory minimum wages? Table 4 gives the marginal effects from the probit model (described in Section IV) for both national and state-level minimum wages for salaried and casual labour. The results for national and state-level minimum wages are in most cases in the same direction, and the only difference is in the size of the effects. As expected, illiterate and those with no more than middle-level education are more likely to earn below the minimum wage among both salaried and casual labour. Everything else held constant, there is a marginally higher probability for Scheduled Tribes (ST) and Other Backward Classes (Other BC) to earn below minimum wage compared to Upper castes. But there is a higher probability for Scheduled Castes (SC) salaried workers to earn minimum wages, which may be because many work in formal enterprises at the lower cadre (Class IV employees), which is to a large extent due to the reservation policy to support such groups. This becomes evident in the case of casual workers where, in the absence of such a policy, there is a higher probability for such workers to earn below minimum wages. Being a women and living in rural areas also increases the chances of receiving less than the minimum. Strikingly, for women this is mostly due to differences among salaried workers, where being a woman increases the probability of not receiving the minimum wage by 17 per cent.

Table 4: Probit estimates of workers receiving below minimum wages, ages 15-64 years, India, 2004-05

	Salaried				Casual labour			
	Model 1		***Model 2***		***Model 1***		***Model 2***	
	Marginal effects		***Marginal effects***		***Marginal effects***		***Marginal effects***	
Predicted outcome	0.1527		0.2142		0.4536		0.5234	
Age	-0.0203***	(0.001)	-0.0219***	(0.001)	-0.0012	(0.001)	0.0053***	(0.001)
Age squared	0.0002***	(0.000)	0.0002***	(0.000)	0.0000**	(0.000)	-0.0000*	(0.000)
Sex (male)								
Female	0.1674***	(0.006)	0.1571***	(0.006)	-0.0645***	(0.006)	-0.1138***	(0.006)
Living in urban areas	-0.0262***	(0.004)	-0.0111**	(0.005)	-0.0159***	(0.006)	0.0162***	(0.006)
Level of education (above secondary school)								
Illiterate	0.2723***	(0.011)	0.2895***	(0.011)	0.1723***	(0.017)	0.1061***	(0.016)
Literate	0.2021***	(0.012)	0.2093***	(0.012)	0.1095***	(0.017)	0.0586***	(0.017)
Primary school	0.1633***	(0.009)	0.1817***	(0.010)	0.0581***	(0.017)	0.0382*	(0.017)
Middle school	0.1236***	(0.008)	0.1345***	(0.008)	0.0363**	(0.018)	0.0353**	(0.017)
Secondary school	0.0764***	(0.007)	0.0924***	(0.008)	0.0103	(0.020)	0.0160	(0.019)
Caste (forward castes/Hindus)								
Scheduled caste	-0.0201***	(0.006)	-0.0530***	(0.007)	0.0327***	(0.009)	0.0226***	(0.009)
Scheduled tribe	0.0499***	(0.006)	0.0777***	(0.007)	-0.0053	(0.007)	0.0571***	(0.007)
Other backward caste	0.0569***	(0.005)	0.0898***	(0.005)	-0.0147**	(0.007)	0.0397***	(0.007)
Industry categories (mining, electricity, gas and water)								
Agriculture	0.3581***	(0.027)	0.3664***	(0.025)	0.0395**	(0.020)	-0.0200	(0.020)
Manufacturing	0.1549***	(0.019)	0.2324***	(0.020)	0.0255**	(0.020)	-0.0090	(0.020)
Construction	0.0880***	(0.025)	0.1384***	(0.027)	-0.1267***	(0.018)	-0.1436***	(0.019)
Low-productive services	0.1652***	(0.020)	0.2199***	(0.020)	0.0668***	(0.021)	-0.0090	(0.021)
High-productive services	0.0594***	(0.013)	0.0766***	(0.015)	-0.0766***	(0.021)	-0.0832***	(0.022)
Occupation categories (professionals)								
Administration	-0.0080	(0.010)	0.0072	(0.012)	-0.0117	(0.034)	0.0161	(0.034)
Clerical	0.0072	(0.007)	0.0228**	(0.008)	0.0245	(0.032)	0.0686*	(0.031)
Sales	0.0877***	(0.011)	0.1282***	(0.012)	0.0082	(0.027)	0.0495*	(0.026)
Service	0.1005***	(0.009)	0.1312***	(0.011)	0.0718***	(0.026)	0.1079***	(0.025)
Farmers	0.0589***	(0.010)	0.0695***	(0.011)	0.0095	(0.023)	0.0304	(0.023)
Production workers	0.0435***	(0.007)	0.0654***	(0.008)	-0.0253	(0.023)	0.0077	(0.023)
Size of the enterprise (large enterprises)								
Tiny	0.1485***	(0.005)	0.1855***	(0.006)				
Small	0.1067***	(0.008)	0.1322***	(0.009)				
Medium	0.0564***	(0.008)	0.0820***	(0.008)				

Notes*:* Text in parentheses is reference category. Figures in parentheses are standard errors. *** denotes significance at the 1 per cent level; ** denotes significance at the 5 per cent level; * denotes significance at the 10 per cent level.

Model 1: National minimum wage floor; Model 2: State-level minimum wages

Looking at industry groups, we see that for salaried workers the probability of receiving below minimum wages is much higher in agriculture than in any other sector, while casual workers seem to be particularly at risk in the construction sector. In terms of occupation, service workers are most frequently underpaid, whether they are salaried or casual worker. Production workers have a higher probability of receiving minimum wages as they are often unionized. Firm size matters too. Salaried workers working in tiny enterprises as compared to large enterprises had a higher probability to earn below minimum wages (+15 per cent in the case of the national minimum wage floor and +19 per cent in the case of state-level minimum wages).

(b) Effects on wage inequality

By how much could an extended mandatory minimum wage in support of low-paid workers reduce overall wage inequality? Our results show that at the existing wages that workers earn, the Gini coefficient for wage inequality is 0.499. When we impute the prevailing national minimum wage floor for all workers who earn below minimum wage, we find that inequality would decline by a considerable 9 percentage points to 0.410. The decline is much steeper in rural than in urban areas, indicating that a larger proportion of those in rural areas currently earn below the minimum (Table 5). If we impute the state-level minimum wages for all workers who earn below the minimum wage, then the inequality further declines by another percentage point to 0.398.

Table 5: Wage inequality, by sector

Sector	Actual wage	Adjusting for national minimum wage	Adjusting for state-level minimum wage
Rural	0.482	0.357	0.357
Urban	0.486	0.432	0.413
All	0.499	0.410	0.398

Source: Computed from the raw data provided by the National Sample Survey Organisation, Employment-Unemployment Survey, 2004-05.

A comparison across industry groups shows that wage inequality is currently higher in manufacturing and low-productive service sector. When we impute the prevailing minimum wage for all workers who earn below minimum wage, we find that in agriculture and in the low-productive service sector the wage inequality would decline by more than 15 percentage points. This is followed by the manufacturing sector, where wage inequality would decline by 10 percentage points (Table 6). The decline in wage inequality in mining, electricity, gas and water, and high-productive service sector is comparatively low or minimal, implying that the extent of minimum wage coverage in these sectors is quite high. The results are very similar when we impute the state-level minimum wages for all workers earning below the minimum wage. We find that, even if we were to expand the existing national minimum floor wage or state-level minimum wages to all workers, the impact is quite substantial, especially in rural areas and in certain sectors.

Table 6: Wage inequality by industry groups

Industry groups	Actual wage	Adjusting for minimum wage	Adjusting for state-level minimum wage
Agriculture	0.307	0.097	0.170
Mining, electricity ,gas and water	0.437	0.415	0.405
Manufacturing	0.456	0.366	0.350
Construction	0.297	0.219	0.229
Low-productive service sector	0.410	0.248	0.267
High-productive service sector	0.395	0.375	0.363

Source: Computed from the raw data provided by the National Sample Survey Organisation, Employment-Unemployment Survey, 2004-05.

The expansion of minimum wages would not only reduce inequalities across and within sectors, but would also reduce the gender wage gap. We estimated two earnings functions with the log of actual daily wage earnings, and adjusted national minimum wage daily earnings for the year 2004-05 and the exponential of the sex coefficient provides an estimate of women's adjusted relative wage. The analysis was done for salaried and casual workers separately. Both the earnings functions are controlled for age, experience, schooling, occupation, industry, caste, size of the firm, region and state dummies. The results reveal that, if all workers receive at least minimum wages then, among salaried workers, the gender wage gap would narrow from 0.84 to 0.90, i.e. by 6 percentage points. Among casual workers, the wage gap would narrow from 0.74 to 0.92, by 18 percentage points. Thus, we find that if minimum wages were to expand to all workers, then the impact would be enormous for female casual workers.

It is worth repeating at this stage that our estimates are based on the assumption that an extended mandatory minimum wage, either at national or at state level, would be perfectly enforced. Although this may be unrealistic and provide some upper-bound estimates, increases in minimum wages have usually been found to substantially reduce wage inequality, even in the presence of imperfect compliance. Lemos (2007), for example, explored the effects of changes in the minimum wage on the wage distribution for Brazil using the Brazilian household surveys from 1982 to 2000. She defined "fraction affected" as the number of workers who were previously earning less than 103 per cent of the new minimum wage but at least 98 per cent of the old minimum wage. Her analysis excludes workers paid at rates that are clearly below the minimum wage. She finds that the minimum wage strongly compresses the wage distribution in both the private and the public sector. But whereas the compression effect is at the bottom of the wage distribution in the public sector, it is higher up in the private sector. Thus, the minimum wage does not seem to benefit the lowest paid in the private sector – probably due to imperfect compliance. Nonetheless, a 10 per cent increase in the minimum wage reduces the 90-10 wage gap by 1.25 per cent and the 75-25 wage gap by 2.14 per cent.

Card and Kruger (1995, Chapter 9) had earlier estimated the impact of the change in the U.S. federal minimum in 1990-91 by using inter-state variation in wage changes over a three-year period, from 1989 to 1991. The authors regressed the state-specific change in the wage gap between the 90^{th} and the 10^{th} percentile wages on the state-specific fraction of workers "affected" by the change in the minimum wage. In this analysis, the "fraction affected" is measured as the number of workers who were previously earning less than the new minimum wage but at least as much as the old minimum wage.[16] Results show that the "fraction affected" by the minimum wage is a statistically significant predictor of the extent to which inequality has fallen within states.

The minimum wage succeeded in reducing the overall wage inequality in both Brazil and the United States. Multiplying the coefficient of the independent variable by the nation-wide "fraction affected" in the United States (8.7 per cent of workers), the authors extrapolate that the 1990-91 minimum wage increase had compressed the economy-wide 90-10 wage gap by -0.055, and hence rolled back about one-third of the previous decade's accumulated increase in wage inequality. To place things into perspective, however, Card and Krueger (1995) caution that the distributional effects are "necessarily limited", since a typical increase in the federal rate "generates only a 10 to 15 percent wage increase for less than 10 percent of the lowest paid workers in the economy" and transfers "approximately 5.5 billion dollars per year to low-wage workers – only about 0.2 percent of total annual earnings." (p. 277). In the case of our simulations for India, the effects are likely to be

[16] Note that such a method leaves out sub-minimum wage-earners and assumes, quite realistically, that an increase in the minimum wage will not by itself reduce non-compliance.

much larger, as they relate not to a marginal increase in the minimum wage rate but to the first-time enforcement of a nation-wide minimum wage floor which could potentially benefit up to 76 million low-paid wage-earners. Yet in terms of GDP, a back-of-the-envelope calculation suggests that even with full compliance, and assuming a full employment situation, a minimum wage would hardly transfer more than about 1.5 per cent of India's GDP.

(c) Effects on poverty reduction

Has the minimum wage the ability to help workers who live in poor households? In the literature, it is often argued that minimum wages benefit workers in the formal economy who usually live in non-poor families. However in India, as in other developing countries, a relatively high proportion of poor, low-skilled people in both rural and urban areas are wage-earners. Our analysis of Indian data for 2004-05 shows that about 30 per cent of salaried workers and 40 per cent of casual workers who earn below minimum wages belong to poor families (and that among the workers belonging to poor families, about 50 per cent earn below the minimum wage). If these poor workers were to receive at least the minimum wage, it would presumably help them and their families move out of poverty.

Assuming complete compliance with a national minimum wage for all wage workers at 2004-05 level, we can estimate the potential impact on workers' probability of being poor (i.e. living in poor household). Our findings show that for salaried workers, the fact of being paid below the minimum wage currently increases the probability of being poor by 9 to 10 per cent (Table 7). For casual workers, not receiving the national minimum wage raises the probability of living in poverty by 7 to 8 per cent. These results indicate that the enforcement of national minimum wages would reduce the probability for wage-earners of being poor by anywhere between 7 to 10 per cent.[17] Similarly, complete compliance or enforcement of state-level minimum wages would reduce the probability for wage-earners being poor by 3 to 6 per cent. The marginal effects of the probit estimates also bring out that minimum wage is the third most important factor in reducing the poverty risk for the wage-earner household after education and location, if extended to all workers. Clearly this is a significant effect and strongly suggests that minimum wages, whether national or state level, may help in lifting a significant number of low-income families out of poverty.

[17] These figures, when compared to developed countries, might be similar, but one needs to be cautious while making such comparisons. This is because these poverty effects are only for the wage-earners who comprise 45 per cent of the workforce and the remaining are self-employed, as compared to advanced countries where the wage-earners would comprise more than 80 per cent of the workforce.

Table 7: Probit estimates of workers in households below the poverty line, ages 15-64 years in India, 2004-05

	Salaried				Casual labour			
	Model 1		***Model 2***		***Model 1***		***Model 2***	
	Marginal effects		***Marginal effects***		***Marginal effects***		***Marginal effects***	
Predicted outcome	0.0782		0.0835		0.3385		0.3276	
Age	0.0043***	(0.001)	0.0036***	(0.001)	0.0047***	(0.001)	0.0065***	(0.001)
Age squared	-0.0000***	(0.000)	-0.0000***	(0.000)	-0.0001***	(0.000)	-0.0001***	(0.000)
Sex (male)								
Female	-0.0139***	(0.003)	-0.0023**	(0.003)	-0.0063	(0.006)	-0.0247***	(0.006)
Not receiving minimum wages	0.0948***	(0.004)	0.0647***	(0.004)	0.0807***	(0.005)	0.0286***	(0.005)
Living in urban areas	0.0999***	(0.003)	0.1027***	(0.003)	0.3608***	(0.006)	0.3503***	(0.006)
Level of education (above secondary school)								
Illiterate	0.2224***	(0.011)	0.2154***	(0.010)	0.2035***	(0.017)	0.1993***	(0.016)
Literate	0.1699***	(0.011)	0.1655***	(0.011)	0.1424***	(0.019)	0.1449***	(0.019)
Primary school	0.1343***	(0.008)	0.1281***	(0.009)	0.0934***	(0.018)	0.1033***	(0.018)
Middle school	0.0848***	(0.006)	0.0962***	(0.006)	0.0559***	(0.018)	0.0751***	(0.018)
Secondary school	0.0493***	(0.006)	0.0523***	(0.006)	0.0208	(0.020)	0.0502**	(0.020)
Caste (forward castes/ Hindus)								
Scheduled caste	0.0308***	(0.006)	0.0229***	(0.006)	0.1607***	(0.009)	0.1397***	(0.009)
Scheduled tribe	0.0642***	(0.005)	0.0613***	(0.005)	0.1004***	(0.008)	0.0876***	(0.007)
Other backward caste	0.0503***	(0.004)	0.0468***	(0.004)	0.0588***	(0.007)	0.0336***	(0.007)
Industry categories (mining, electricity, gas and water)								
Agriculture	0.0639***	(0.017)	0.1200***	(0.020)	0.1127***	(0.020)	0.0845***	(0.019)
Manufacturing	0.0449***	(0.011)	0.0565***	(0.012)	0.0213	(0.021)	0.0056	(0.020)
Construction	0.0371**	(0.017)	0.0618**	(0.019)	0.0502*	(0.020)	0.0489	(0.019)
Low-productive services	0.0641***	(0.013)	0.0798***	(0.014)	0.0890***	(0.022)	0.0773***	(0.022)
High-productive services	0.0378***	(0.008)	0.0446***	(0.009)	0.0029	(0.022)	-0.0199	(0.021)
Occupation categories (professional)								
Administration	-0.0327***	(0.006)	-0.0257***	(0.007)	0.0504	(0.036)	0.0241	(0.035)
Clerical	0.0175***	(0.006)	0.0258***	(0.006)	-0.0542*	(0.032)	-0.1056	(0.029)
Sales	0.0355***	(0.008)	0.0449***	(0.008)	0.1062***	(0.029)	0.1132***	(0.029)
Service	0.0387***	(0.007)	0.0584***	(0.008)	0.0520**	(0.028)	0.0504**	(0.027)
Farmers	0.0701***	(0.010)	0.0842***	(0.010)	0.1381***	(0.024)	0.1234***	(0.023)
Production workers	0.0461***	(0.006)	0.0599***	(0.006)	0.1211***	(0.024)	0.1056***	(0.024)
Size of the enterprise (large enterprises and formal)								
Tiny	0.0471***	(0.004)	0.0522***	(0.004)				
Small	0.0229***	(0.006)	0.0301***	(0.005)				
Medium	0.0011	(0.005)	0.008	(0.005)				

Notes: Text in parentheses is reference category. Figures in parentheses are standard errors. *** denotes significance at the 1 per cent level; ** denotes significance at the 5 per cent level; * denotes significance at the 10 per cent level.

Model 1: National minimum wage floor; Model 2: State-level minimum wages

These results contribute to the renewed debate on whether minimum wage policy is an effective instrument for poverty reduction in developing countries. There are few studies in the existing empirical literature that are directly comparable to ours, as most studies look at the effect of an increase in minimum wage rates rather than at an extension of the coverage. Yet, interesting results arise in Bird and Manning (2008), who calculate that in Indonesia more than 45 per cent of low-wage workers live in poor households (less than PPP US$2 per day) or ultra-poor households (less than PPP US$1 per day). In their simulations, they find that an increase in the minimum wage would reduce the number of people living below PPP US$2 by 2.7 million out of a total of 90.4 million poor people. The authors, however, assume that the net gains in poverty reduction will be much smaller because of higher prices, but they do not take into account the effect of lower inequality on overall aggregate demand. A number of cross-country studies also find that higher minimum wages contribute to lower levels of poverty (Saget, 2001; Lustig and McLeod, 1997). Our results for India are in line with this evidence.

It is perhaps in developed countries that previous research has most questioned the ability of minimum wages to reduce poverty. A number of empirical studies find that increases in minimum wages do not help low-wage workers in poor families but instead support those in higher income brackets. Neumark, Schweitzer and Wascher (1998) use non-parametric analysis to estimate the effects of minimum wage increases on the distribution of family incomes in the United States and show that increases in minimum wages do not reduce the proportion of poor or near-poor households. Other empirical studies have found that minimum wages reduce poverty, but with moderate effects. For the United States, Card and Krueger (1995) estimate that 33 per cent of minimum wage-earners are poor or near-poor and find that a higher minimum wage can result in some reductions in poverty. Mincy (1990) – simulating the impact of increase in minimum wage – found that poverty in the United States can be reduced by 6 per cent to 9 per cent, depending on the assumptions. The issue of the impact of minimum wages on poverty is also debated in Brazil (see Lemos, 2006; and Neumark, Cunningham and Siga, 2006).

(d) Employment effects

While our study so far highlights the important fact that not all wage-earners in India are above the poverty line, our simulations have not yet discussed any potential employment-displacing effect of minimum wages. The implicit assumption in our analysis, so far, has been that minimum wages redistribute incomes without hurting employment. This is not entirely unrealistic. A number of economists now believe that the employment effects of minimum wages are minimal or even altogether "swamped by other factors going on in the economy" (Stiglitz, quoted in Chipman, 2006). The U.K. Low Pay Commission reached the same conclusion after commissioning a large body of research during the first ten years of the country's new national minimum wage (U.K. Low Pay Commission, 2009). This provides some more recent support to Freeman's view that "the debate over the employment effects of the minimum is a debate of values around zero" (Freeman, 1996, p. 642).

Yet, as there is no consensus within the literature, we do not wish to discard the possibility that minimum wages reduce labour demand and the total number of days worked by low-paid workers. The extent to which labour demand may fall depends on the elasticity of labour demand. Indeed, Fields and Kanbur (2007) try to address this theoretically and show how poverty effects of a minimum wage increase depends on four parameters: "how high the minimum wage is relative to the poverty line, how elastic the demand for labour is, how much income-sharing takes place, and how sensitive the poverty measure is to the depth of poverty" (p. 146). Available estimates of the so-called "wage elasticity of employment" vary widely, depending on methodologies and counterfactuals.

While many find an elasticity around zero (as indicated above), others have estimated much more sizeable values.

For the purpose of our simulations we assume two different possibilities: an elasticity of -0.20 and a larger one of -0.5. While the former is taken from the review by Cunningham (2007), according to whom most countries in Latin America were found "experiencing a job loss of 2 percent for a 10 percent increase in the minimum wage" (p. 44), the second estimate is probably an upper-bound. Our simulations are based on the hypothesis that, in a country such as India, the employment effect is more likely to occur through an adjustment of the number of days worked by the employees rather than through an increase in unemployment (see, for example, Neumark and Wascher, 2008, p. 77). As discussed earlier, the dis-employment effects in developing countries are unlikely to result in open unemployment; more likely, the displaced workers will move from wage employment into self-employment.

Table 8: Impact of minimum wage on inequality with employment effects, by sector

Sector	Actual wage	Adjusting for national minimum wage	Elasticity of -0.2	Elasticity of -0.5
Rural	0.482	0.357	0.378	0.410
Urban	0.486	0.432	0.443	0.459
All	0.499	0.411	0.426	0.450

Source: Computed from the raw data provided by the National Sample Survey Organisation, Employment-Unemployment Survey, 2004-05.

Assuming two different employment effects, that is days of work reduced by the employees, we simulate the impact of minimum wages on inequality and we find that an elasticity of -0.2 increases inequality marginally in both rural and urban areas, while an elasticity of -0.5 increases inequality by about 5 percentage points (Table 8). But, in spite of these adverse effects, it is to be noted that the new level of inequality after implementation of the minimum wage is still about 5 percentage points lower than the existing Gini coefficient for wage inequality of 0.499.

Table 9: Impact of minimum wage on poverty with rmployment effects

Sector	Actual wage	Elasticity of -0.2	Elasticity of -0.5
Salaried workers	0.091	0.087	0.084
Casual workers	0.079	0.068	0.051

Source: Computed from the raw data provided by the National Sample Survey Organisation, Employment-Unemployment Survey, 2004-05.

Similarly, we estimate the potential impact on workers' probability of being poor (i.e. living in poor household), with the number of working days reduced for the employees. Earlier we found that if minimum wages were extended to all workers, then the probability of being poor would fall by 7 to 9 per cent depending upon whether the worker was salaried or casual. However, if the number of working days were reduced, as a result of compulsory minimum wages, then the beneficial effects of minimum wages on the probability of poverty would also be reduced. The effects on salaried workers and casual workers depend upon the elasticity of labour demand. Our simulations in Table 9 show that, even under a scenario with a high elasticity of -0.5, minimum wages would still be able to reduce the probability of poverty by 5 per cent to 8 per cent for casual and salaried workers, respectively.

Our results show that minimum wages can play an important part in reducing inequality and poverty even in the presence of some adverse employment effects. This finding is supported by others in the literature. For example, Lustig and McLeod (1997) using cross-country data on developing countries find that a higher minimum wage is associated with lower poverty, even though the higher minimum wage reduces

employment. An important question that requires further consideration, however, concerns the possibility of some employment substitution between men and women. We have seen earlier that the minimum wage would increase the wages of women more than of men and, hence, reduce the gender wage gap. This may lead to two possible outcomes. One, there could be a significant decline in women's employment, especially where men can replace women workers. This is surely a cause for worry, especially where the female worker is the main earner of the household.[18] The second situation is where men are unlikely to replace women workers due to gender segregation of work, like transplanting in agriculture or assembly work in the manufacturing sector.

(e) The full compliance assumption

The paper so far has produced simulations of the benefits of a binding minimum wage under the hypothesis that it would be perfectly enforced. Yet we are aware that the extent to which these benefits can be achieved in practice depends much on the actual degree of compliance. We are also aware of the difficulties with implementation and of the fact that "simply legislating a minimum wage will not make it happen" (Murgai and Ravallion, 2005, p. 2). In practice, compliance is always less than perfect in both developed and developing countries. Yet a large proportion of workers do receive benefits from such legislation as is illustrated in the examples below. In the United States, one statistical analysis using the U.S. Current Population Survey found that about 1.9 million workers – or 2.6 per cent of all hourly paid workers – are paid below the hourly minimum rate in 2008 (Bureau of Labor Statistics, 2009). Non-compliance appears to be slightly lower in the United Kingdom. The Office of National Statistics (ONS) used the Annual Survey of Hours and Earnings to calculate that in April 2005 about 1.3 per cent of all wage-earners or 327,000 workers – a majority of which were women – were paid below the national minimum wage (Metcalf, 2008). Note that in both the United Kingdom and the United States non-compliance does not necessarily mean illegal evasion, but also reflects the existence of exemption and imperfect coverage of the law, such as for apprentices and trainees for example.

Non-compliance in developing countries, as measured by the proportion of wage-earners who are paid below the minimum wage, is comparatively higher. In Indonesia, Rama (2001) used 1993 household data and found that 15 per cent of all full-time urban labourers and employees earned less than the minimum wage, with a much higher rate of non-compliance for women workers at around 34 per cent. In Brazil, Lemos (2005) used the Monthly Employment Survey (PME) to estimate that in 2000 the proportion of workers earning below the minimum wage was 13.7 per cent in the private sector and 4.6 per cent in the public sector. Even at this level of less-than-perfect compliance, a majority of workers in India would be able to benefit from minimum wages, if it is expanded to all workers.

To ensure a high rate of compliance requires a coherent enforcement strategy based on provision of information, effective labour inspections and sanctions in case of violations. Lack of clear information available to employers and workers about the level of minimum wages, and about possible sanctions in case of violation, also reduces the

[18] In households where women have entered the labour market as an additional worker to meet the subsistence needs of the household (that is, poverty-induced), their exit from the labour market could in theory be compensated as long as the male earners are able to get both minimum wages and minimum days of work required for the households.

likelihood of compliance.[19] Another mechanism could be greater involvement of worker's organizations and NGOs to ensure that the implementation machinery is effective (see Labour Bureau, 2005).

Along with a better "enforcement" strategy, the option of government acting as the "employer of last resort" could also be considered. Murgai and Ravallion (2005) suggest that minimum wage legislation in poor countries can only be made really effective if the government acts as the "employer of last resort" and commits to employ the entire excess supply of unskilled workers at the stipulated minimum wage rate. Indeed, from the perspective of workers, the supply of labour at a wage below the minimum depends on available alternatives. If no minimum wage job is available, labour will continue to be supplied at sub-minimum wages. Thus programmes, such as the 2006 National Rural Employment Guarantee (NREG) Programme and the more experienced Employment Guarantee Scheme (EGS) of the State of Maharashtra, can play a key role in fostering compliance with a mandatory minimum wage. At the same time, these benefits must be balanced against the need for these programmes to target the poorest segment of the population and avoid drawing in a large proportion of the labour force.

[19] In this context, it is interesting to note that a recent evaluation study on the implementation of the Minimum Wages Act, 1948, in the stone-breaking and stone-crushing industry in Karnataka in 2007-08 found that, among employers, only 30 per cent reported awareness of the Minimum Wage Act and 27 per cent were aware of the prescribed/statutory minimum wages paid to the workers. Among workers, only 8.4 per cent stated awareness of the Minimum Wage Act and 18.5 per cent were aware of any inspection authority (GoI, 2009b).

Conclusion

In India, the Minimum Wage Act of 1948 is perceived as being of great importance, particularly to the unorganized casual workers which – as our paper calculates – account for two-thirds of all wage-earners and a total number of about 116 million workers. Understandably, therefore, there have been many discussions and arguments about the minimum wage over the years. One important discussion has revolved around the question of what is the appropriate level of the minimum wage to prevent labour "exploitation" and provide a decent standard of living. Another debate concerns the way to increase compliance by elevating the minimum wage to a fundamental right, even equating non-compliance with a form of forced labour. Finally, in India, policy-makers have also discussed for years the possibility of simplifying and extending the coverage of minimum wages to the whole labour force.

Our paper provides a contribution to this last issue, mostly leaving aside the other important policy debates. We attempt to provide some benchmark figures on the possible effects of either making the national minimum wage floor compulsory or extending the coverage of state-level minimum wages. We find that such a policy decision, if fully implemented, would have a significant impact on inequality and poverty in India. The large impact can be easily explained by our finding that an extension of either system of minimum wages could potentially improve the wages and the lives of about 73 to 76 million low-paid workers.

By providing an effective backstop for wages, a minimum wage can compress inequality and, in particular, reduce the distance between the low paid and those in the middle of the wage distribution. Our review of the theoretical literature also indicates that a more equal distribution of wages may have the economic benefit of increasing private consumption and aggregate demand at the national level. This effect arises because poorer workers spend a higher proportion of their incomes on consumption (particularly food and other essential commodities) than richer workers, who tend to save more. These economic benefits, however, may arise at the cost of some reduction in short-term labour demand and in the quantity of days worked by minimum wage beneficiaries.

We find that, if the minimum wage has no adverse effects on the demand for labour, the Gini coefficient for wage inequality would fall from a very high close to 0.50 in actuality to anywhere between 0.39 and 0.41, which is closer to the level of inequality found in other lower middle-income countries (as can be observed in Figure 2). As expected, the effects are largest in agriculture and in low-productive sectors. If minimum wages have some adverse effects on the number of days worked, the fall in inequality is reduced by an amount which depends on the assumed elasticity of labour demand. We provide some benchmark figures but, by any realistic assumption, the extension of minimum wages reduces inequality in spite of some adverse effects on the number of days in employment.

An important effect of an extended minimum wage would be a sharp reduction in the gender pay gap. We find that if all workers would receive at least minimum wages, average wages of women compared to men would increase from 84 per cent to 90 per cent for salaried workers and from 74 per cent to 92 per cent for casual workers. This effect does not arise because women are over-represented among workers with sub-minimum wage. From our dataset, we calculate that women represent about one-third of all wage-earners and also about one-third of the sub-minimum wage population. Rather, our strong results stem from the fact that, even among sub-minimum wage workers, women are paid lower wages than their male counterparts. Lifting all wages to the mandatory minimum would eliminate inequality among the lowest paid.

Significant impacts can also be expected on the number of wage-earners who live in poverty. Although the literature has often questioned the relevance of minimum wages to the poverty debates, our analysis shows that – among the sub-minimum wage population – more than one-third of wage-earners actually live in poverty. Hence, the minimum wages is a policy tool that can reach directly into poor households. With the actual number of days worked kept constant, we find that the payment of a national minimum wage would reduce low-paid workers' probability of being poor by 8 per cent to 9 per cent. In case of a large decline in days worked, this positive effect is marginally reduced – but remains largely positive.

For all these reasons, an extension in the coverage of minimum wages, either through a national minimum wage floor or through state-level minimum wages, would probably bring worthwhile social benefits to India. Although we recognize that a minimum wage is not ideally targeted nor necessarily the most cost-effective way to achieve poverty reduction, we consider that the combined effects on inequality, poverty and the gender pay gap at low fiscal costs make it a useful instrument. In a country such as India, where the majority of wage workers have no access to social security benefits – and where many types of income-transfer programmes remain unrealistic – extending minimum wages to the whole labour force would be a step towards more social justice.

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Appendix I: Employments originally included in the schedule of the Minimum Wage Act, 1948

1. Employment in any woollen carpet-making or shawl-weaving establishment (not fixed).

2. Employment in any rice mill, flour mill or dal mill.

3. Employment in any tobacco (including beedi making) manufactory.

4. Employment in any plantation, that is to say, any estate which is maintained for the purpose of growing cinchona, rubber, tea or coffee.

5. Employment in any oil mill.

6. Employment under any local authority.

7. Employment on the construction or maintenance of roads or in building operations.

8. Employment in stone breaking or stone crushing.

9. Employment in any lac manufactory (not fixed).

10. Employment in any mica works (not fixed).

11. Employment in Public Motor Transport.

12. Employment in tanneries and leather manufactory.

13. Employment in agriculture, that is to say in any form of farming including the cultivation and tillage of the soil; dairy farming; the production, cultivation, growing and harvesting of any agricultural or horticultural commodity; the raising of livestock, bees or poultry; and any practice performed by a farmer or on a farm as incidental to or in conjunction with farm operation (including any forestry or timbering operations, and the preparation for market and delivery to storage or to market or to carriage for transportation to market of farm produce).

Appendix II: State-level minimum wages

	States	Minimum wages (in Rs.)
1	Andhra Pradesh	77
2	Arunachal Pradesh	40
3	Assam	47
4	Bihar	59
5	Goa	121
6	Gujarat	74
7	Haryana	88
8	Himachal Pradesh	65
9	Jammu and Kashmir	66
10	Karnataka	79
11	Kerala	200
12	Madhya Pradesh	66
13	Maharashtra	66
14	Manipur	63
15	Meghalaya	70
16	Mizoram	84
17	Nagaland	66
18	Orissa	52
19	Punjab	89
20	Rajasthan	74
21	Sikkim	66
22	Tamil Nadu	89
23	Tripura	66
24	Uttar Pradesh	86
25	West Bengal	66
26	Andaman and Nicobar Islands	108
27	Chandigarh	109
28	Dadra and Nagar Haveli	66
29	Daman and Diu	66
30	Delhi	111
31	Lakshadweep	82
32	Pondicherry	66
33	Chhattisgarh	86
34	Jharkhand	66
35	Uttaranchal	78

Source: Labour Bureau, 2004. From the table "Number of Scheduled Employments in Central Sphere/ State/ UTs and Range of Minimum Wages as on 31-12-2004", at http://labourbureau.nic.in/wagetab.htm.