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Research Paper No. 2008/23

Minimum Wages, Globalization, and Poverty in Honduras

T. H. Gindling¹ and Katherine Terrell²

March 2008

Abstract

To be competitive in the global economy, some argue that Latin American countries need to reduce or eliminate labour market regulations such as minimum wage legislation because they constrain job creation and hence increase poverty. On the other hand, minimum wage increases can have a direct positive impact on family income and may therefore help to reduce poverty. We take advantage of a complex minimum wage system in a poor country that has been exposed to the forces of globalization to test whether minimum wages are an effective poverty reduction tool in this environment. We find the net effect of minimum wage increases in Honduras is the reduction of extreme poverty, with an elasticity of -0.18, and all poverty, with an elasticity of -0.10 (using the national poverty lines). These results are driven entirely by the effect on workers in large private sector firms, where minimum wage legislation is enforced. Increases in the minimum do not affect the incidence of poverty among workers in sectors where minimum wages are not enforced (small firms) or do not apply (self-employed and public sector). Hence, we show that minimum wages can be used as a poverty reduction tool in the formal sector. However, we do not endorse minimum wages as the best tool as we have not carried out a complete cost-benefit analysis of this policy *vis-à-vis* others.

Keywords: minimum wage, poverty, Central America, Honduras

JEL classification: J23, J31, J38

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Tables and figures appear at the end of this paper.

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1 Introduction

This paper examines the role of minimum wage legislation in reducing poverty in Honduras. The justification for minimum wage legislation is to protect low wage workers. This policy tool can be especially important in developing countries during periods of rapid adjustment to the global economy. However, in an era when global competition is very strong, several policymakers are arguing for reductions in (and even the abolition of) minimum wages and other labour market regulation in Latin America to allow for more labour market flexibility and increased competitiveness (see e.g., Heckman and Pagés 2003). The main argument of the proponents of this view is that rigidities in the labour market, such as wage rigidity caused by the minimum wage, can slow down job creation and in turn contribute to unemployment and poverty (see e.g., Micco and Pagés 2004). On the other hand, others argue that fierce competition in the globalized world is also creating an environment that some have termed ‘the race to the bottom’. This group is concerned that wages and working conditions are being driven down by global competition and argue that there is a need to uphold the bottom with regulations such as the minimum wage and labour standards. Acemoglu’s (2001) theoretical model, which shows that minimum wages can shift the composition of employment toward high-wage jobs, supports this latter view. Hence, increases in minimum wages could contribute to the reduction of poverty by increasing the incomes of those affected by the legislation and perhaps even increasing the share of higher wage jobs in the economy.¹

This paper contributes to the debate on the value of minimum wages by providing evidence on the effects of minimum wage increases on poverty in a relatively poor country which was open to the global economy during the 2001–2004 period.² Honduras has for decades set over 22 minimum wages (by industry and firm size) for all salaried employees in the private sector. There is a large group of workers (the self-employed and public sector) for whom minimum wages do not apply directly, but whose wages and employment can be affected indirectly either through the mobility of workers across sectors in response to changes in the minimum wage or through institutions, such as unions, that try to emulate the minimum wage increase in their sector’s wages. We combine microdata from the household surveys with data on minimum wages to determine whether increases in the minimum wage affect the probability that a typical individual in the labour force, as well as different types of workers in both the covered and uncovered sectors are more or less likely to be poor.

We find that minimum wage increases do reduce extreme poverty: A 10 per cent increase in the minimum wage will reduce the probability that an average individual in the labour force is in extreme poverty by 1.8 per cent (i.e., from 44 per cent to 43.2 per cent) and in poverty by 1 per cent (although this latter finding is close to but not

¹ Speaking to this point, a recent paper by Gutierrez et al. (2007) shows, with data from a large number of developing countries, that not all increases in employment are associated with poverty reduction. In particular, employment increases in agriculture are associated with poverty increases whereas employment increases in manufacturing and services are associated with poverty reduction.

² The period of analysis is circumscribed by the fact that microdata on poverty are not available until 2001.

statistically significant by conventional levels). These results are driven entirely by the effect on workers in large private sector firms, where a 10 per cent increase in the minimum wage reduces extreme poverty and poverty by 2 per cent and 1.9 per cent, respectively. Increases in the minimum wage do not seem to affect the net probability of being poor for individuals employed or previously employed in a small firm, or as self-employed or in the public sector. We stress that these findings are net effects and do not account for the many channels through which this outcome is driven, which are discussed briefly in the next section.

2 Theoretical considerations and empirical literature

The minimum wage as a poverty reducing tool is problematical for a number of reasons. To begin with, it is difficult to predict the direct effect of the minimum wage on the wages and employment of workers to whom the law applies. As Freeman (1996: 639) notes ‘The goal of the minimum wage is not, of course, to reduce employment, but to redistribute earnings to low paid workers’. Yet, most of the literature using data from the US and around the world has found negative employment effects.³ There are a few studies using data from the US (Card and Krueger 1994, 1995) and the UK (Machin and Manning 1994) that have found no or positive employment effects. If minimum wages raise wages and have no disemployment effects (as predicted by models based on imperfect information or monopsony), then minimum wage increases will certainly raise the earnings of low wage workers. However, if the labour market is competitive and the elasticity of demand for labour in the covered sector is high (greater than 1), minimum wages will reduce the share of total earnings to low paid workers by displacing a larger number from employment than the number whose wages are raised by the minimum wage.⁴ Whether the displaced worker’s earnings fall below the per capita poverty level is of course a function of a host of variables including, the existence and generosity of the social safety net, the flexibility of the labour market, the demand for the workers’ skills, etc. In addition to disemployment and wage effects, there are of course other ways that workers covered by minimum wage legislation can gain or lose from increases in the minimum wage, including adjustments in hours worked and reduction in non-wage benefits which could also affect whether a worker moves into or out of poverty.⁵ Finally, if there are spill-over effects, such that workers above the minimum also gain from minimum wage increases, then there can be larger positive income effects on low wage workers.⁶

A second set of issues to consider is the indirect effect of minimum wage increases on workers in sectors not covered by minimum wage legislation (or in sectors where there is no compliance with minimum wage legislation). Minimum wages can indirectly

³ See Brown (1999) and Neumark and Wascher (2006) for reviews of the evidence.

⁴ See Neumark and Wascher (2002: 316–318) for an extensive discussion of the assumed elasticities in the literature and the actual measured elasticities for affected workers.

⁵ See Brown (1999) for a full discussion of the many adjustments in the labour market that can result from an increase in the minimum wage.

⁶ Fajnzylber (2001) and Maloney and Núñez (2003) have found large spill-over effects in Latin American countries.

contribute to poverty creation in the uncovered sector if workers who lose their job in the covered sector greatly increase their labour supply to the uncovered sector, lowering wages below the per capita poverty line. In this two-sector competitive model of the labour market, the final effect on the uncovered sector will depend on the elasticities of labour demand and supply in both sectors. However, if there are institutions which try to garner the level and increases in minimum wage in the uncovered sector, then reductions in poverty of families of workers in the uncovered sectors might be an outcome.

In considering the potential for minimum wage policy to reduce poverty, we must recognize that poverty is a function of a worker's family income, which raises a third set of issues: it requires addressing whether low wage workers are in low income families. Hikes in the minimum wage that raise the incomes of low wage workers can only reduce poverty to the extent that those workers are in low income families. Gramlich (1976) was one of the first to note that minimum wage workers can live in relatively affluent families. More recently Burkhauser et al. (1996) show that only one-third of the workers in the US affected by the 1990 minimum wage increase were in poor or near poor families. (Another third of the workers were in families with incomes more than three times the poverty line.)

Assuming a worker is in a low income household, a related issue is that minimum wages can have different effects on family income depending on who in the household is directly impacted and the labour supply responses of that person or other household members. For example, one could envision scenarios where increases in the minimum wage could bring a family out of poverty if a secondary earner decides to join the labour force because the wage increase is above her reservation wage (Addison and Blackburn 1999; Freeman 1996). However, an increase in the minimum wage might also cause a family to fall into poverty if it is the head of the household who loses his or her job as a result of the increase (and other members are not able to increase their hours of work or find a job if not working). Which workers gain and which lose can influence whether the family's income is above or below the poverty line.

Finally, a fourth factor to consider is the relative level of the minimum wage to the per capita poverty line.⁷ One might expect that raising the minimum wage could have a bigger effect reducing poverty if the minimum wage is set at or slightly above the per capita poverty line than if it is set at four times the per capita poverty line. However, the relative level of the minimum wage to the per capita poverty line also reflects the government's/society's view as to whether the minimum wage is meant to cover the basic needs of one worker or that of a family, and the extent to which families are expected to rely on one vs. two breadwinners. For example, if the society believes that the minimum wage should cover only the basic needs of a worker, a family of four with only one household member earning the minimum wage will be poor; raising the minimum wage in this scenario would have no impact on poverty reduction. On the other hand, if the minimum wage is meant to meet the basic needs of a family, then raising the minimum wage in this scenario is more likely to reduce poverty.

⁷ See Fields and Kanbur (2006) for a theoretical treatment of the impact of minimum wages on poverty reduction which focuses on four parameters: the elasticity of labour demand, the ratio of the minimum wage to the poverty line, the extent of income sharing in the household and the degree of poverty aversion.

Because of all these factors, it is difficult to predict what the consequences of a minimum wage increase are for poverty and the distribution of family incomes. We turn to the empirical literature on this question, which unfortunately is sparse in comparison to the literature on the wage and employment effects. We begin with the US literature and then review the literature for developing countries, which not surprisingly is larger.

Card and Krueger (1995) provide one of the first estimates of the effect of minimum wages on poverty in the US. They regress the change in a state's poverty rate from 1989–1991 on the fraction of the state's workers that are affected by the minimum wage increase in 1990–1991 and provide some weak evidence (mostly insignificant) for a modest poverty reducing effect of the minimum wage.⁸ Addison and Blackburn (1999) also use state panel data and a methodology similar to Card and Krueger's (1995), however they use a longer time frame (1983–1996) and focus solely on low wage families. They find that increases in minimum wages reduce the poverty level among teenagers and junior high school dropouts. However, when they analyse the relationship separately for the 1980s and 1990s, they find it is only statistically significant in the 1990s.⁹ Neumark and Wascher (2002) have recently contributed to the literature with a study that goes beyond estimating the net effects by measuring flows into and out of poverty. They present evidence, using US CPS data that increases in the minimum wage raises both the probability that some poor families escape poverty and the probability that some previously non-poor families fall into poverty. They conclude that the combined evidence indicates a redistribution of income among the poor rather than from the non-poor to the poor.

Several studies have examined the effect of minimum wages on poverty in developing countries, mostly in Latin America. Studies using aggregate country data tend to find minimum wage increases reduce poverty. For example, Morley (1995), using data for Latin American countries, finds that poverty falls with an increase in the minimum wage during upswings in the business cycle by not during recessions. Lustig and McLeod (1996) regress changes in poverty indicators (using alternative measures) in Latin American and Asian countries on their minimum wage changes (controlling for other variables associated with changes in poverty) and find higher minimum wages are associated with lower levels of poverty in both regions, whether the economy was growing or declining, and the population was urban or not. However, they also find that minimum wage increases raise unemployment and hence they do not endorse minimum wages as an effective policy to reduce poverty. Saget (2001) uses data on a cross section of countries and finds a negative and significant relationship between the level of poverty (using a national poverty line) and the level of the minimum wage (in US\$), after controlling for the GDP/capita, average wage in manufacturing and location. However, the results from a subset of countries where the regression could be run using the US\$1 or US\$2 a day international poverty line show no significant correlation. Saget (2001: 22) concludes that:

⁸ The 'fraction affected' was the share of workers whose wage was between the minimum wage in 1990 and the new minimum wage in 1991.

⁹ Their search for explanations of the different outcomes in the 1980s and 1990s did not come up with anything conclusive.

This result confirms our intuition that minimum wages in developing countries do not affect the poorest share of the population, but rather the upper levels of the low income population.

Whereas the country-level studies in developing economies have a fairly consistent message, studies using microdata do not always find that poverty falls with a rise in the minimum wage. For example, IPEA (2000) provides simulation evidence using Brazilian microdata that an increase in minimum wage has no effect on poverty, once the unemployment effects of the minimum wage increase are taken into account. Arango and Pachón's (2003) study, using Colombian panel data on urban areas, finds minimum wages improve the living conditions of families in the middle and upper part of the income distribution with net losses for those at the bottom. They also find significant negative minimum wage effects on both the likelihood of being employed and hours worked, especially for women, the young and less educated workers. On the other hand, Cunningham and Siga (2006) find that minimum wages increases household earnings among the poor and that the poorest households experience the highest wage gains in Mexico. The World Bank (2006) attributes the difference in Arango and Pachón's (2003) and Cunningham and Siga's (2006) findings for Colombia and Mexico, respectively, to the fact that minimum wages are relatively low in Mexico and relatively high in Colombia.

The Arango and Pachón (2003) and Neumark et al. (2006) studies also begin to explore the impact of the minimum wage on the labour supply responses of different members of the household by examining separately the probabilities of employment and the change in the hours worked of the heads vs. non-heads of households. Arango and Pachón (2003) find that an increase in the minimum wage relative to the median wage reduces the likelihood that a household head is employed; this negative effect is larger for women and less educated people. Although the findings for non-heads are not directly comparable to those for heads, the authors claim that increases in the ratio of the minimum wage to the median raises the probability of unemployment of non-heads and also increases their probability of participation in the labour market, which the authors interpret as a 'third-bread-giver response to negative family income shocks' (p. 24).

Hence the sparse literature on minimum wages and poverty has provided inconclusive evidence on the question of the impact of increases in the minimum wage on the level of poverty. Most of the evidence is of reduced form with estimates of the correlation between (changes in) poverty and (changes in) the minimum wage. The older studies, using country level data, were more likely to find a negative relationship between minimum wage hikes and poverty than the more recent studies based on microdata. Some recent students are beginning to look at the structural relationships and are providing a richer understanding of the household responses to minimum wage increases.

3 Minimum wages and poverty in Honduras

During the period under study (2001–2004), Honduras set 22 minimum wages – for small (1–15 employees) and large (16+ employees) firms in eleven industries – which were adjusted about two times a year.¹⁰ These minima applied to all salaried employees in the private sector; hence the public sector and the self-employed are the ‘uncovered sector’.¹¹ Appendix Table A1 summarizes the data on minimum wages from the decrees that we use in our analysis. These are daily minimum wages deflated to December 1999 prices using the monthly Consumer Price Index provided by the Bank of Honduras. In our empirical work we use all 22 minimum wage categories. We note that the minimum wage for large firms was on average 27 per cent higher than the minimum for small firms during this period and that the rate of growth of real minimum wages was more rapid for small firms (4 per cent per year) than for large firms (1 per cent per year). Hence over the five-year period, minimum wages for small firms rose by 11.9 per cent while for large firms they only rose by 3.3 per cent.

The second data set we use is the Permanent Household Surveys for Multiple Purposes (PHSMP), which is a nationally representative survey that was carried out two times a year (in May and September) during 2001–2004. These surveys provide information on the economic activity, firm size and location of each person’s job, which allows us to append to each worker and each unemployed person who has worked before the minimum wage that corresponds to his/her job in a given month and year.¹² The daily minimum wages were converted into monthly and hourly minimums in order to have them in the same units as the salary data in the PHSMP.

In order to get a sense of the variation in the real minimum wage over time in relation to the real wage, we plot in the first graph (upper left quadrant) of Figure 1 the average real wage and minimum wage (in Lempiras, December 1999 prices) of all private sector employees for each survey during 2001–2004.¹³ The average real hourly minimum wage increased by 3.8 per cent per annum on average or 10.9 per cent from May 2001 to May 2004.¹⁴

¹⁰ The information on the structure of minimum wages was gathered from interviews with staff at the Ministry of Labour and Social Security in Honduras during Jan.–March, 2005 and from a report by the Secretaria de Trabajo y Seguridad Social (2003).

¹¹ A separate wage grid applies to public sector employees who are not covered by union agreements. Among the unionized civil servants, there are two groups (medical staff and teachers) whose base wage has at times been adjusted with a formula tied to minimum wage adjustments.

¹² Unfortunately, we are not able to assign a minimum wage to those outside of the labour force or to unemployed workers who have never worked before because we do not know the firm size and industry of their job; the applicable minimum wage depends on these two characteristics of the job. However, since the unemployed who worked before are on average over three-quarters (76 per cent) of all unemployed during the period under study, our results represent the vast majority of the unemployed.

¹³ These minimum wages are averaged over all private sector employees, hence over large and small firms and over the 10 industries in the PHSMP.

¹⁴ However, the annual increases in the average real minimum wage are more erratic and very different when using May to May annual changes (15.1 per cent increase between 2001 and 2002; a 5.9 per cent decline in 2002–2003; and a 2.3 per cent rise in 2003–2004) than when using the September to September annual changes (0 changes between 2001 and 2002 and 6.5 per cent increase between 2002

During this period the minimum wage is between about 0.45 and 0.56 of the average wage, which is relatively high when compared with the US, where the ratio is about 0.38 in this period. It is above the median of the 19 Latin American and Caribbean countries in Kristensen and Cunningham's (2006) study. They show that about half of their sample have ratios between 0.18 and 0.40 while twenty per cent have ratios between 0.60 and 0.72 (for around the 1997–2000 period).

The graphs in the lower half of Figure 1 are presented to show that Honduras was enjoying a period of relative stability and growth after the destruction created by Hurricane Mitch in 1999. Inflation ranged between 6.0 per cent and 9.6 per cent and GDP was growing at an average annual rate of about 4.3 per cent, without any significant shocks.

Honduras is a relatively poor country. With a GNI per capita of US\$1,040 in 2004 (World Bank Indicators), it is the fourth poorest country in Central America (but very close to Nicaragua, the poorest country). It has the highest poverty headcount ratio in the region, which has remained fairly constant since 1990 (Trejos and Gindling, 2004). Since 2001, microdata have been available on two levels of poverty – poverty and extreme poverty – from the household surveys (PHSMPs). The extremely poor poverty line is constructed from the cost of a basic basket of foodstuff yielding 1,200 calories a day. A household is considered extremely poor if its per capita earnings are less than the cost of this basic basket of food. The poverty line is constructed from a basic basket of goods that includes housing and education services in addition to the basic basket of food.

To get a sense of the levels poverty and its trend in Honduras, we present in the upper right quadrant of Figure 1 a bar graph with the shares of the labour force which fall in each of three categories – extremely poor, poor and non-poor – calculated at each of the PHSMP survey dates from 2001 to 2004. The average shares over the entire period are in the bottom row of Table 1. As can be seen, a very large percentage of the labour force in Honduras – on average 44 per cent – is considered extremely poor, with an additional 19 per cent (for a total of 63 per cent) considered poor, leaving only about 37 per cent of the work force as non-poor. The bar charts in Figure 1 indicate that over these four years, these shares are fairly constant, with only small fluctuations around the mean.

We also show in Table 1 the unconditional probability that different groups in the labour force are poor. The rates of extreme poverty are highest among those working in small firms, 46 per cent, or self-employed, 51 per cent (which together account for almost three-quarters of the labour force); workers and unemployed who are unskilled, 49 per cent (two-thirds of the labour force); young people between 15 and 21 years of age, 50 per cent (which account for one-quarter of the labour force); and individuals living in rural areas, 62 per cent (almost half of the labour force). Although these patterns are typical, the gap between the urban and rural extreme poverty rates is remarkably large in Honduras. We note that the measure we present here is comparable but not equivalent to the poverty head count measure, which measures the share of the population below the poverty line.

and 2003). This is of a function primarily of when the minimum wage was last raised and how much inflation there was in the interim, and to a lesser extent to changes in the distribution of workers across industry and firms size.

How high is the minimum wage relative to the household per capita poverty line? At 3.5 times the national per capita poverty line, the World Bank (2006) ranks Honduras' ratio third out of 20 Latin American and Caribbean countries, with Guyana being the highest (6.5 times the poverty line) and Chile the second highest (at about 3.8 times the poverty line).¹⁵ We noted earlier that if the minimum wage is set high relative to the poverty line, then raising it may have no impact because it is raising the income of the middle (a bit like the findings of Arango and Pachón, 2003, for Colombia). In Honduras a minimum wage earner can provide three dependents with the basic needs above the poverty. However, in a country where the female labour force participation rate is low and the average family size is large, this minimum does not necessarily cover the basic needs of the typical family of five with only one income earner. Hence, there is scope for a reduction in poverty from raising the minimum.

Finally, we noted that in the US literature there is a concern that individuals who earn the minimum wage are not in poor households. Hence, we calculate the share of workers who earn within 10 per cent of the minimum wage (i.e., $0.9MW < W < 1.1MW$) that are poor. We show in Table 2 that 71 per cent of all workers who earn the minimum wage are in poor households, which indicates that raising the minimum wage could have a substantial effect on poverty.¹⁶ We list the probabilities for various groups in the population and see that raising the minimum wage for household heads, unskilled, men and older individuals, could potentially lift more families out of poverty than raising it for workers who are non-heads, skilled, women and younger individuals.

4 The impact of the minimum wage on the distribution of wages

We begin by reporting evidence of the effect of the minimum wage on the wage distribution of our four groups of interest: the two covered sectors (large firms and the small firm in the private sector) and the two sectors not formally covered by minimum wage legislation (self-employed and the public sector). It is common in the literature to look for spikes in the wage distribution at or around the minimum wage (e.g., Dinardo et al. 1996) and the fraction at the minimum wage (Card and Krueger 1995).

In Figure 2 we plot separately for the four sectors the kernel density estimates of the log wage minus log minimum wage for each worker, where a zero indicates that the worker is earning the legal minimum wage. If legal minimum wages are enforced in a particular sector, we would expect to see the distribution of wages censored from below at the level of the minimum wage, with no (or very few) workers earning below the minimum wage. We might also expect to see a density at zero (at the minimum wage) to be higher in the covered sector than in the uncovered sector. We find this only in the kernel density estimates for covered workers in large firms (the top left panel). The distributions for workers in the small firm covered sector, self-employed and public sector workers are not censored and there is no spike at the minimum. In these three sectors, there is no indication that minimum wages affect the distribution of wages.

¹⁵ World Bank (2006) notes that at US\$7 per day the Honduran poverty line is also far above the US\$2 per day poverty line.

¹⁶ We note from Table 1 that the average individual in the labour force has a 0.63 probability of being poor in Honduras, and the probability is higher for those earning the minimum wage.

Another way to summarize the information presented in Figure 2 is to calculate the average share of workers earning less than, at, or more than the minimum wages within each of these four sectors.¹⁷ We find the share at the minimum wages is substantially higher among private sector employees in large firms (12.4 per cent) than among private sector employees in small firms (9.7 per cent), among the self-employed (7.1 per cent) or in the public sector (5.3 per cent), again pointing to higher enforcement in the large firm private sector. Similarly, we find relatively fewer workers earn less than 90 per cent of the minimum wage in the large firm covered sector (16.9 per cent) than in the small firm private sectors (39.8 per cent). Hence the combined evidence of the wage distribution, and the average share earning below and at the minimum wage point, leads to better enforcement of minimum wages in the large firm covered sector than in small firms, where we might conject that there is little or no enforcement.

In a companion paper (Gindling and Terrell 2007b) we use an industry-level panel data set to estimate the wage and employment effects of changing minimum wages in Honduras. In that paper we find that increases in the minimum wage are correlated with higher average wages in the large firm covered sector. At the same time, higher minimum wages reduce employment in the large firm covered sector.¹⁸ We find no significant wage effects on workers in the small firms or self-employed workers. However, we do find a significant impact on wages of civil servants suggesting that the public sector adjusts its wage levels with changes in the minimum wage.

With these three pieces of evidence, we conclude that minimum wages are effectively enforced only in large firms and not in the small firms covered by minimum wage legislation. There is an emulation effect on wages in the public sector, in terms of adjusting the average wage but no effect on the earnings of the self-employed.

5 Econometric methodology and findings

Our goal is to estimate the extent to which an increase in minimum wages increases/decreases the probability that a person in the labour force (with particular characteristics) will be poor or extremely poor. We begin by estimating the following equation with a Probit model using individual level data on members of the labour force (employed plus unemployed who worked before) using a pooled data set of all seven surveys from 2001 to 2004.¹⁹

¹⁷ We use a bound of 10 per cent to allow for measurement error so that we are actually measuring the share earning less than 0.9 of the minimum wages, within 0.9 and 1.1 of the minimum wages and more than 1.1 of the minimum wages.

¹⁸ We estimate that an increase in real minimum wages of 10 per cent reduces employment by 4.6 per cent.

¹⁹ The data in the regression are weighted by sample weights. Estimated standard errors are robust to heteroskedasticity and serial correlation as well as corrected for the clustering of errors around minimum wage categories at each survey date.

$$Poor_{it} = a_0 + a_1 \ln MW_{it} + \overline{X_{it}} \beta + \sum_{j=1}^J \lambda_j IND_{ij} + \sum_{t=1}^T \gamma_t YR_t + \mu_{it} \quad (1)$$

where $Poor_{it}$ equals 1 if the worker i is living in a poor (or extremely poor) family at time t . The explanatory variable of interest is $\ln MW_{it}$, the log of the real hourly minimum wage (Lempiras 1999) that applies to that firm size and industry at time t . The coefficient α_1 is an estimate of the effect of one per cent increase in legal minimum wage on the probability an individual in the labour force is poor. The vector X_{it} , controls for other factors that explain low wages and poverty (education, age, age squared, family size, dummy variables for rural/urban location and gender). We include fixed effects for the month and date of the survey, YR_t , to control for changes in the survey design and any time specific factors such as aggregate supply and aggregate demand changes or changes in the timing of the surveys. We also include 22 industry/firm size dummies (IND_{it}) to control for industry/firm size specific fixed effects and for the endogenous correlation of employment and minimum wages across industry categories.

Because we find that minimum wages are only complied with in large firms, we also estimate separate coefficients for the effects on individuals in large vs. small firms (covered sector) as well as for individuals of the two uncovered sectors – self-employed and public sector workers.

The coefficients on the minimum wage (α_1) presented in Table 3 indicate that a 10 per cent increase in the minimum wage will lower the probability that a person in the labour force is extremely poor by 1.8 per cent and may lower the probability that a person in the labour force is poor by 1 per cent, although this second coefficient is not statistically significant at conventional levels. The findings in the next rows demonstrate clearly that the negative relationship between changes in minimum wages and poverty is being driven entirely by the higher wages in the large firm sector as the coefficients on all other sectors are insignificant. Hence workers who are in the large firm sector gain from a minimum wage increase in terms of some leaving poverty. Since there is not compliance with minimum wage in the small scale sector, it is not surprising that workers here are not made worse or better off – in terms of poverty – by minimum wage hikes. Finally, the results in Table 3 also imply that poverty in the two uncovered sectors is also not affected by changes in the minimum wage. However, as we see from Figure 2, for different reasons: for the self-employed sector we see that minimum wages do not affect wages. Whereas they do affect changes in wages of civil servants, their wage distribution is set above the minimum wage and hence any upward adjustments brought about by the minimum wage only serve to make the average civil servant's wage stay relatively high.

We next ask whether the findings in the first row of Table 3 hold more strongly for low paid workers than for high paid workers. Hence, in separate Probit regressions we interact the minimum wage variable in equation (1) with a dummy variable for different characteristics of workers that signal low vs. higher pay: i.e., unskilled, people with up to an elementary school education, vs. skilled, with more than an elementary school education; heads vs. non-heads of households; urban vs. rural; male vs. female; and younger (15 to 21 years of age) vs. older (21+ years) individuals. The estimated coefficients from these interacted variables are shown in Table 4; they indicate that in almost all cases, the relationship between increases in the minimum wage and poverty reduction is stronger among the lower paid workers (unskilled, rural, female and young) than among their higher paid counterparts. For example a 10 per cent increase in the

minimum wage reduces the probability that a woman is extremely poor by 3.3 per cent and poor by 2.3 per cent whereas the point estimates for men are much smaller and not statistically significant. This would lower the incidence of extreme poverty among women from 33.9 per cent to 33.1 per cent and their incidence of poverty from 21.4 per cent to 20.7 per cent. The one case where this does not hold is with heads and non-heads of households. The evidence presented in Table 4 suggests that hikes in the minimum wages lowers the probability that the head of a household is poor by more than it lowers the probability that the non-head of a household is poor. This is important because the proportion of working household heads that are poor is a stronger indicator of the proportion of families who are poor. These results suggest that minimum wages in Honduras are correlated with a bigger reduction in families in poverty than the results for individual workers (from Table 3) would suggest.

In Table 5 we address the question of whether this minimum wage/poverty relationship, which we learned in Table 3, is being driven by changes in the large scale sector, continues to hold for workers with low pay more than for workers with higher pay in large vs. small firms. The findings in Table 5 show that indeed, the coefficients for small firms are nearly all insignificant whereas for large firms they are nearly all significant. Within large firms, the estimates indicate that minimum wages have a larger impact on poverty among the unskilled relative to the skilled, the old relative to the young, and especially in the rural areas relative to the urban areas. Their impact on poverty reduction is not significantly different among heads vs. non-heads of households and between men and women in the large firm sector.

7 Conclusions

We conclude from these findings that increases in the minimum had a modest poverty reducing effect in Honduras during 2001–2004: a 10 per cent increase in the minimum wage is associated with a 1.8 per cent fall in extreme poverty and a 1.0 per cent decline in poverty among all individuals in the labour force. Checking this with the historical record, we note that minimum wages in Honduras rose by 10.9 per cent over this period; and extreme poverty fell from 46.8 per cent to 42.1 per cent, which is more than the 1.8 per cent decline predicted by our model, indicating additional factors are at play in reducing poverty.

The impact of minimum wages on overall poverty reduction is modest in part because it is driven by one sector where minimum wages are enforced – i.e., the large firm sector – where only 20 per cent of the labour force is located. We find no indirect (significantly negative or positive) effects on the small firm sector (where minimum wages should apply but are not enforced) or the two uncovered sectors (self-employed and public sector).

Closer inspection of the relative effects on lower paid vs. higher paid workers indicates that the poverty reduction effects tend to be larger among the lower paid. Workers in the rural areas experience the largest poverty reduction impact: a 10 per cent increase in the minimum wage lowers extreme poverty by 4.4 per cent and poverty by 4.1 per cent in rural areas. We find, contrary to findings by Saget (2001) and Arango and Pachón (2003), that Honduras' minimum wage impacts extreme poverty as well as poverty in

spite of a relatively high minimum wage (in terms of the official poverty line or average wage).

We stress that these findings are reduced form estimates of the net impact of minimum wages on poverty. A more thorough analysis using panel data on individuals (which is not available in Honduras) would estimate a structural/dynamic model of the channels in the household driving these net effects on poverty reduction.

We noted at the outset that questions are being raised with respect to the role of minimum wages in a fiercely competitive global economy. Some argue that they impede employment creation, especially of ‘good’ jobs (Heckman and Pagés 2003; Pagés and Micco 2006) while others argue that minimum wages can shift the composition of employment toward ‘good jobs’ (Acemoglu 2001). We have shown in companion studies that minimum wage legislation can reduce the share of good jobs in the formal/regulated sectors in Honduras (Gindling and Terrell 2007b) and Costa Rica (Gindling and Terrell 2007a), counter to Acemoglu’s (2001) theoretical model. Yet, we have shown in this paper that increases in minimum wages reduce poverty among workers in the large firm sector. How do we justify these seemingly incongruous results? One channel will be the result of the wage gain for those workers who retain their jobs. Another channel might be that the worker who lost his/her job from the minimum wage reduction is able to find a job in the uncovered sector at a good wage, which we are not able to test with our data. Or, it is possible that another member in the household increased his/her labour supply in response to the minimum wage increase in order to keep the family out of poverty. This latter channel can be interpreted as a reduction in the household’s welfare if not an increase in its poverty. Moreover, if the increased supply of labour is from a child that should be in school, then there are implications for long term poverty among the next generation.

In an era of globalization, the extent to which countries are competitive is an important consideration. However, one would hope that governments could help protect their workers from fierce competition (the ‘race to the bottom’) by creating an environment that enables good job creation and poverty reduction while at the same time not hampering and hopefully enhancing firms’ competitiveness. This is a difficult challenge. In that context, however, there is the argument that raising minimum wages forces employers to consider investing in capital and other complementary factors that increase a worker’s productivity when they otherwise might not have. This argument would imply that increased minimum wages may stimulate employers to seek ways to increase their efficiency and remain competitive in the global economy. However, there is no evidence, especially from developing countries, for this hypothesis.

In conclusion, before one could endorse minimum wage policy as a poverty reduction tool, more evidence needs to be garnered with respect to the channels through which it operates in the household and in the firm as well as its costs (direct and indirect) and benefits relative to those of other interventions. For example, it is possible that the direct fiscal burden associated with minimum wages may be lower than other redistributive interventions (e.g., targeted social programmes) and its benefits higher, if for example, employers do indeed invest in improving worker productivity. However, it is also possible that other instruments (e.g., transfers, education) yield more poverty reduction for the same unit of resources allocated to implementing and monitoring a minimum wage policy. Hence, further research is needed to properly address this difficult policy question.

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Appendix

Table A1 Real daily minimum wage (Dec. 1999 Monthly prices)

Sector	May 2001	Sept 2001	May 2002	Sept 2002	March 2003	Sept 2003	May 2004
<i>Agriculture, hunting and fishing</i>							
1–15 workers	34.60	33.73	35.25	32.83	36.82	35.85	37.91
16+ workers	48.62	47.39	49.47	46.08	50.30	48.97	50.45
<i>Non-metallic mining</i>							
60.55	59.02	61.03	56.85	61.97	60.34	62.16	
<i>Metallic mining</i>							
1–15 workers	36.33	35.41	38.72	36.07	40.44	44.06	41.65
16+ workers	50.35	49.07	52.71	49.10	53.46	56.74	53.64
<i>Manufacturing</i>							
1–15 workers	36.33	35.41	38.72	36.07	40.44	39.37	41.65
16+ workers	50.35	49.07	52.71	49.10	53.46	52.05	53.64
<i>Utilities</i>							
54.76	53.37	61.03	56.85	61.97	60.34	62.16	
<i>Construction</i>							
1–15 workers	36.33	35.41	38.72	36.07	40.44	39.37	41.65
16+ workers	50.35	49.07	52.71	49.10	53.46	52.05	53.64
<i>Trade, hotels and restaurants</i>							
1–15 workers	36.33	35.41	38.72	36.07	40.44	39.37	41.65
16+ workers	50.35	49.07	52.71	49.10	53.46	52.05	53.64
<i>Transportation, storage and communication</i>							
1–15 workers	41.09	40.05	44.06	41.04	46.54	45.31	47.40
16+ workers	52.08	50.76	51.09	47.59	51.88	50.51	52.04
<i>Financial services</i>							
1–15 workers	54.76	53.37	61.03	56.85	61.97	60.34	62.16
16+ workers	60.55	59.02	61.03	56.85	61.97	60.34	62.16
<i>Real estate</i>							
1–15 workers	41.09	40.05	44.06	41.04	46.01	45.31	47.40
16+ workers	52.08	50.76	51.09	47.59	51.88	50.51	52.04
<i>Business services</i>							
1–15 workers	41.09	40.05	44.06	41.04	41.04	39.96	37.77
16+ workers	52.08	50.76	51.09	47.59	47.59	46.33	43.80
<i>Communal services</i>							
1–15 workers	36.33	35.41	38.72	36.07	40.44	39.37	41.65
16+ workers	50.35	49.07	52.71	49.10	53.46	52.05	53.64

Source: Minimum wage decrees

Table 1 Poverty rates for different types of workers in Honduras (avg. for 2001–2004)

Area	Extremely poor	Poor	Non-poor	Share of total
Covered large	19.0	24.7	56.2	20.3%
Covered small	46.4	19.9	33.7	36.3%
Self-employed	51.1	17.8	31.1	36.2%
Public	9.8	18.9	71.4	7.2%
Unskilled*	49.3	20.5	30.2	67.6%
Skilled**	14.5	21.1	64.4	32.4%
Non-head	41.2	20.1	38.7	56.6%
Head	41.1	19.9	39.0	43.4%
Rural	62.0	9.9	28.1	48.3%
Urban	27.1	27.4	45.5	51.7%
Female	33.9	21.4	44.8	35.8%
Male	45.2	19.3	35.5	64.2%
Young (15–21)	50.4	19.5	30.0	24.4%
Older (21+)	38.2	20.2	41.6	75.6%
All workers + unemp.	44.0	18.9	37.1	100.0%

Notes: *Unskilled are individuals primary or less education.

**Skilled are individuals with some secondary or higher education.

Source: Authors calculations from the Honduran Household Surveys.

Table 2 Percent of workers who earn within 10% of the minimum wage that are poor
(average over 2001-2004)

All workers	71
Skilled	60
Unskilled	72
Household head	80
Non-head	64
Urban	71
Rural	70
Male	75
Female	63
Old	73
Young	64

Source: Authors calculations from the Honduran household surveys.

Table 3 Impact of an increase in the minimum wage on the poor and the extremely poor:
all workers plus unemployed and workers by sector and large and small firms

Sample	Poor	Extremely poor
All workers plus	-0.103	-0.184**
Unemployed	(0.074)	(0.084)
Covered large firms	-0.191**	-0.195***
	(0.081)	(0.055)
Covered small firms	0.454	0.158
	(0.459)	(0.397)
Self-employed	0.292	0.495
	(0.341)	(0.440)
Public sector	0.144	-0.024
	(0.238)	(0.121)

Notes: a) Coefficients on the log of the Minimum Wage estimated with a Probit as specified in the equation in the text for each sample indicated in the first column.
b) Regressions use data on workers and the unemployed who worked before. It excludes the unpaid family workers, and those who report zero or missing earnings or hours worked.
c) Standard errors, in parentheses, are robust to heteroskedasticity and serial correlation as well as corrected for the clustering of errors around minimum wage categories in each year.
*significant at the 0.10 confidence level; **significant at the 0.05 confidence level; ***significant at the 0.01 confidence level.

Table 4 Impact of an increase in the minimum wage on the poor and the extremely poor for sub-groups in the labour force

Sample	Poor	Extremely poor
Unskilled	-0.136 <i>0.086</i>	-0.222** <i>0.094</i>
Skilled	-0.078 <i>0.083</i>	-0.131 <i>0.100</i>
Non-head	-0.087 <i>0.073</i>	-0.173** <i>0.083</i>
Head	-0.134* <i>0.073</i>	-0.212*** <i>0.082</i>
Rural	-0.406*** <i>0.086</i>	-0.440*** <i>0.087</i>
Urban	0.058 <i>0.073</i>	-0.027 <i>0.084</i>
Female	-0.225** <i>0.097</i>	-0.334*** <i>0.109</i>
Male	-0.031 <i>0.077</i>	-0.109 <i>0.085</i>
Young (15–21)	-0.161* <i>0.093</i>	-0.231** <i>0.099</i>
Older (21+)	-0.082 <i>0.073</i>	-0.170** <i>0.082</i>

Notes: a) Coefficients on the log of the Minimum Wage estimated with a Probit as specified in the equation in the text for each subgroup indicated in the first column.
b) Regressions use data on workers and the unemployed who worked before. It excludes the unpaid family workers, and those who report zero or missing earnings or hours worked.
c) Standard errors, in italics, are robust to heteroskedasticity and serial correlation as well as corrected for the clustering of errors around minimum wage categories in each year.
*significant at the 0.10 confidence level; **significant at the 0.05 confidence level; ***significant at the 0.01 confidence level.

Table 5 Impact of an increase in the minimum wage on the poor and the extremely poor for sub-groups in the labour force in small and large firms

Sample	Large firms		Small firms	
	Poor	Extremely poor	Poor	Extremely poor
Unskilled	-0.373*** <i>0.104</i>	-0.279*** <i>0.073</i>	0.612 <i>0.532</i>	0.263 <i>0.414</i>
Skilled	-0.009 <i>0.120</i>	-0.001 <i>0.096</i>	0.76 <i>0.553</i>	0.456 <i>0.486</i>
Non-head	-0.134* <i>0.078</i>	-0.170*** <i>0.054</i>	0.511 <i>0.441</i>	0.108 <i>0.394</i>
Head	-0.219*** <i>0.076</i>	-0.205*** <i>0.059</i>	0.468 <i>0.441</i>	0.058 <i>0.393</i>
Rural	-0.512*** <i>0.134</i>	-0.381*** <i>0.094</i>	-0.068 <i>0.427</i>	-0.156 <i>0.351</i>
Urban	-0.015 <i>0.072</i>	-0.063 <i>0.049</i>	0.592 <i>0.401</i>	0.189 <i>0.383</i>
Female	-0.166 <i>0.114</i>	-0.277** <i>0.112</i>	1.054** <i>0.512</i>	0.687 <i>0.547</i>
Male	-0.197** <i>0.084</i>	-0.187*** <i>0.051</i>	0.319 <i>0.419</i>	-0.058 <i>0.345</i>
Young	-0.125 <i>0.149</i>	0.080 <i>0.102</i>	0.662 <i>0.486</i>	0.103 <i>0.550</i>
Old	-0.159** <i>0.080</i>	-0.208*** <i>0.056</i>	0.47 <i>0.435</i>	0.098 <i>0.414</i>

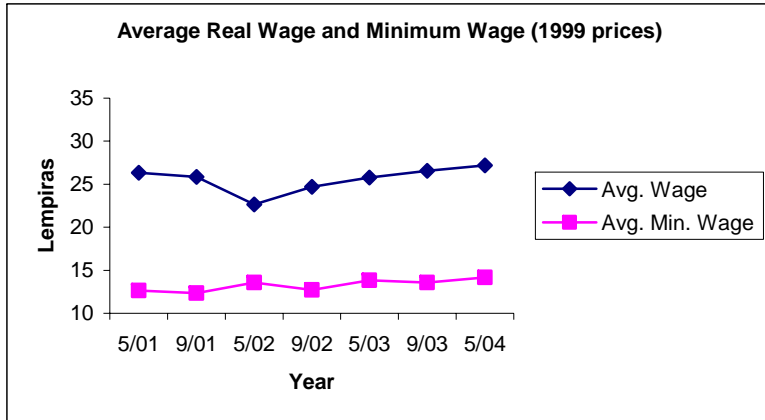
Notes: a) Coefficients on the log of the Minimum Wage estimated with a Probit as specified in the equation in the text for each subgroup indicated in the first column.

b) Regressions use data on workers and the unemployed who worked before. It excludes the unpaid family workers, and those who report zero or missing earnings or hours worked.

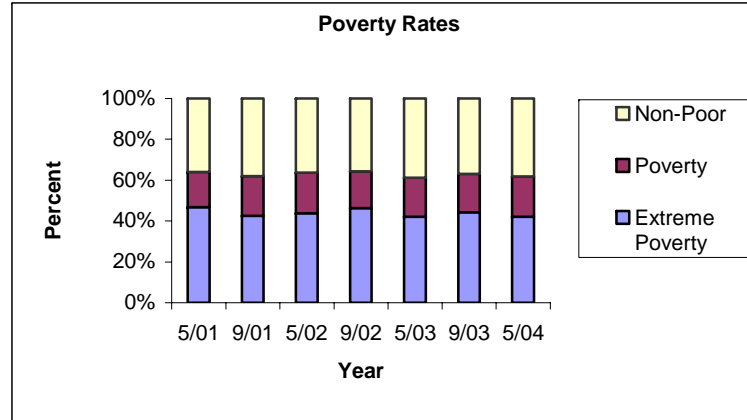
c) Standard errors, in italics, are robust to heteroskedasticity and serial correlation as well as corrected for the clustering of errors around minimum wage categories in each year.

*significant at the 0.10 confidence level; **significant at the 0.05 confidence level; ***significant at the 0.01 confidence level.

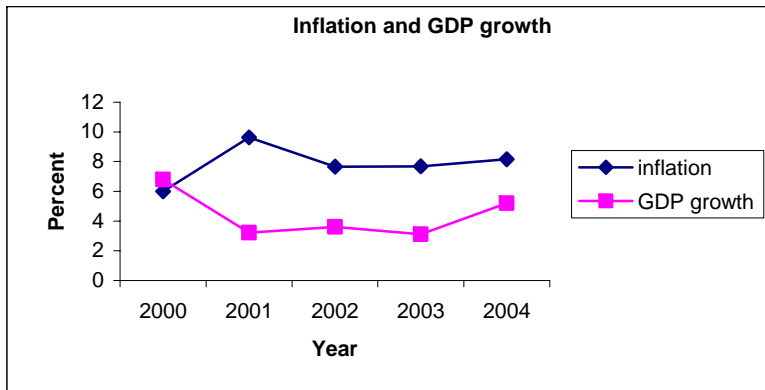
Figure 1 Macroeconomic indicators for Honduras (2000–2004)



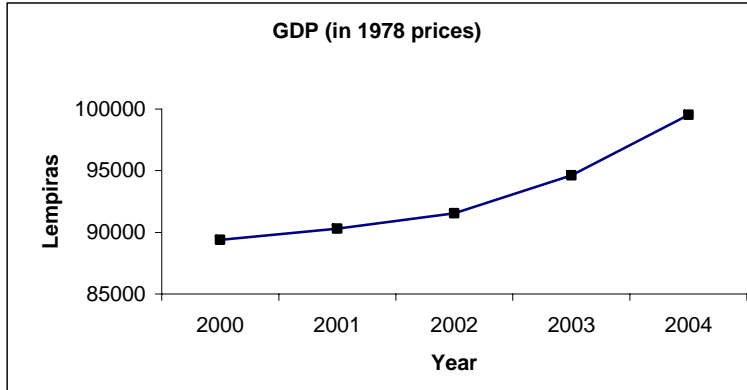
Source: Author's calculations from the Honduran Household Survey



Source: Author's calculations from the Honduran Household Survey



Source: Central Bank of Honduras



Source: Central Bank of Honduras

Figure 2 Kernel density distribution of the log wage minus the log minimum wage in each sector

