Minimum Wages, Globalization and Poverty in Honduras

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Abstract:

We test whether minimum wage legislation is an effective poverty reduction tool in a poor country trying to stay competitive in the global economy. We find in Honduras that increases in relatively high minimum wages lead to reductions in poverty, especially extreme poverty. However, the impact is felt only in households with workers in large firms (where legislation is enforced) and it is felt more strongly among those with low-wage workers. Increases in the minimum do not affect poverty in sectors where minimum wages are not enforced or do not apply. Hence minimum wages can be a poverty reduction tool in the formal sector, which competes globally.

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 and, if effective, this policy tool could 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, numerous economists and policy makers are arguing for reductions in (and even the abolition of) minimum wages and other labor market regulation in Latin America to allow for more labor market flexibility and increased competitiveness (see e.g., Heckman and Pages, 2003). The main argument of the proponents of this view is that rigidities in the labor 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, Cowen and Pages 2004).

An opposing view is that fierce competition in the globalized world is creating an environment that some have termed "the race to the bottom." The proponents of this view are 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 labor 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.[i]

Our paper contributes to this academic 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 and negotiating a new trade agreement during the period of analysis (2001-2004).[ii] Our findings also shed light on the specific policy debate in Honduras that arose during the negotiations of the Central American Free Trade Agreement (CAFTA) at the beginning of the decade. Although the Hondurans agreed to increase enforcement of minimum wages and labor standards in CAFTA, they were concerned about the extent to which enforcing these policies would reduce Honduras' competitiveness. Our evidence on the impact of minimum wages on poverty before enforcement was strengthened provides a baseline from which the Honduran government and business sector can test for the impact of higher enforcement.

Tests for the impact of minimum wages on household income must take into account the fact that only part of the workforce is directly affected by minimum wage legislation. There is a large group of workers 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 micro data from the household surveys with data on minimum wages to determine whether increases in the minimum wage affect the probability that a typical individual as well as individuals from households with different types of workers in the covered and uncovered sectors, are more or less likely to be poor.

We find that minimum wage increases do reduce poverty: A 10% increase in the minimum wage will reduce the probability that an average individual in the population is in extreme poverty by 2.2 percentage points (i.e., from 47.7% to 45.5%) and in poverty by 0.9 percentage points. These results are driven entirely by the effect on workers in

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large private sector firms where a 10% increase in the minimum wage reduces extreme poverty and poverty by 2.5 and 1.1 percentage points, respectively. On the other hand, minimum wage legislation has no significant effect on the poverty of those who work in small private sector firms, the self-employed or wage earners 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 we discuss 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 (the covered sector). As Freeman (1996, p. 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.[iii] There are a few studies using data from the US (Card and Krueger, 1994 and 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 labor market is competitive and the elasticity of demand for labor 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.[iv] Whether or not the displaced workers' 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 labor 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.[v] Finally, if there are spillover 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.[vi]

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 (the uncovered sector). Minimum wages can indirectly contribute to poverty creation in this sector if workers who lose their job in the covered sector greatly increase their labor supply to the uncovered sector, lowering wages below the per capita poverty line. In this two-sector competitive model of the labor market, the final effect on the uncovered sector will depend on the elasticities of labor 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 the minimum wage 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 (e.g., whether it is the primary or secondary earner) and what is the labor supply response of that person as well as the labor response of 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 labor 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 looses 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 loose 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.[vii] 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/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 bread-winners. 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 and 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 is more likely to reduce poverty.

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 to 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.[viii] The study by Addison and Blackburn (1999) also uses state panel data and a methodology similar to Card and Krueger's (1995), however it uses a longer time frame (1983-1996) and focuses 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 analyze the

relationship separately for the 1980s and 1900s, they find it is only statistically significant in the 1990s.[ix] Neumark and Wascher (2002) have recently contributed to the literature with a study that goes beyond estimating these 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 level data tend to find minimum wage increases reduce poverty. For example, Morley (1992), using cross country data from Latin America, finds that poverty falls with an increase in the minimum wage during upswings in the business cycle by not during recessions. Lustig and McLeod (1997) 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 dollars), 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. Sagat (2001, p. 22) concludes that "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 cross-country studies in developing economies have a fairly consistent message, studies using micro data do not always find that poverty falls with a rise in the minimum wage. For example, IPEA (2000) provides simulation evidence using Brazilian micro-data 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 (2004) 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 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 (2004) 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 (2004) and Neumark, Cunningham and Siga (2006) studies also begin to explore the impact of the minimum wage on the labor 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 v. non-heads of households. Arango and Pachón (2004) 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 labor 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 mixed 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 cross-country data, were more likely to find a negative relationship between minimum wage hikes and poverty than the more recent studies based on micro data. 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. BACKGROUND ON POVERTY AND MINIMUM WAGES IN HONDURAS

(a) Poverty Levels

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, micro data have been available on household poverty from the Permanent Household Surveys for Multiple Purposes (PHSMP). This nationally representative survey provides data on more than 20,000 households two times a year (in May and September) during 2001-2004. The PHSMP indicates if households are "extremely poor" or "poor," using the national poverty lines. The extremely poor poverty line is constructed from the cost of a basic basket of foodstuff yielding a minimum number of 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 for the "poor" 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 level of poverty in Honduras, we present in Table 1 the average unconditional probabilities that an individual is extremely poor, poor or non-poor over the 2001-2004 period, both overall and by the characteristics of the household members who are in the labor force. As can be seen, a very large percentage of the population (48%) is considered extremely poor; an additional 19% (for a total of 67%) is considered poor, leaving only about 33% of the population as non-poor. The rates of extreme poverty are highest among individuals where a working member in the household is employed by a small firm, 54%, or is self-employed, 59% (workers in these sectors together account for almost three-quarters of the labor force); unskilled, 54% (two-thirds of the labor force); young, 54% (which account for one-quarter of the labor force); and living in rural areas, 65% (almost half of the labor force). Although these

patterns are typical, the gap between the urban and rural extreme poverty rates is remarkably large in Honduras.[x]

[TABLE 1 ABOUT HERE]

To get a sense of the trend in poverty over the 2001-2004 period, we present in Figure 1 a bar graph with the shares of the population which fall in each of three categories – extremely poor, poor and non poor – calculated at each of the PHSMP survey dates. The data indicate there was a reduction in extreme poverty (from 51.1% to 45.6%) but that the share of the population that is poor was fairly constant (about 19%).

[FIGURE 1 ABOUT HERE]

(b) Minimum Wage Structure and its Enforcement

During the period under study, Honduras set at least 22 minimum wages -- for small firms (1-15 employees) and large firms (16+ employees) in eleven industries -- and they were adjusted about two times a year.[xi] These minima applied to all wage earners in the private sector; hence the public sector and the self-employed are considered the "uncovered sector."[xii] Because the characteristics of the two uncovered labor markets differ significantly, we treat them separately in the analysis.

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% 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 year) than for large firms (1% per year). Hence over the five-year

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period, minimum wages for small firms rose by 11.9% while for large firms they only rose by 3.3%.

We are able to match the legislated minimum wage in a given month/year which corresponds to each worker in the PHSMP surveys since we have information on the economic activity, firm size and location of each job for both individuals who are employed or unemployed and worked before.[xiii] (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 Figure 2 (first graph) the average real minimum wages and wages (in *Lempiras*, December 1999 prices) of all private sector employees for each survey date during 2001-2004. The average real hourly minimum wage increased by 3.8% per annum on average or 10.9% from May 2001 to May 2004.[xiv]

[FIGURE 2 ABOUT HERE]

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 U.S., 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 percent have ratios between 0.60 and 0.72 (for around the 1997-2000 period).

The second graph in Figure 2 is presented to show that Honduras was enjoying a period of relative stability and growth after the destruction created by Hurricane Mitch in

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1999. Inflation ranged between 6.0% and 9.6% and GDP was growing at an average annual rate of about 4.3%, without any significant shocks.

How high is the minimum wage relative to the poverty line? At 3.5 times the national household 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). [xv] 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, 2006, 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 labor 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 percent of the minimum wage (i.e., 0.9MW<W<1.1MW) who live in poor households. We show in Table 2 that 71% 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.[xvi] 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.

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[TABLE 2 ABOUT HERE]

4. THE IMPACT OF THE MINIMUM WAGE ON THE DISTRIBUTION OF WAGES

We begin by reporting evidence on the effect of the minimum wage on the wage distribution of our four groups of interest: the two covered sectors (large and small firms 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, Fortin and Lemieux, 1996) and the fraction at the minimum wage (Card, 1995) in order to learn whether or not there is an impact or compliance with the legislation. In Figure 3 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 affects the distribution of wages.

[FIGURE 3 ABOUT HERE]

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Another way to summarize the information presented in Figure 3 is to calculate the average share of workers earning less than, at, or more than the minimum wage within each of these covered and uncovered sectors.[xvii] We find the share at the minimum wage is substantially higher among private sector employees in large firms (12.4%) than among workers in any of the other sectors -- private sector employees in small firms (9.7%), the self employed (7.1%) or in the public sector (5.3%) -- again pointing to higher enforcement in the large firm private sector. Similarly, we find a smaller share of workers earn less than 90% of the minimum wage in the large firm covered sector (16.9%) than in the small firm private sectors (39.8%).

In a companion paper (Gindling and Terrell, 2007a), 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.[xviii] 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 will be poor or extremely poor. We begin by estimating the following equation with a probit model using pooled data from all seven surveys in 2001-2004 on individuals in the labor force (employed plus unemployed who worked before):

$$Poor_{it} = a_o + a_1 lnMW_{sjt} + \overline{X_{it}}\beta + \sum_{j=1}^{J} \lambda_j IND_j + \sum_{t=1}^{T} \gamma_t YR_t + \mu_{it} \qquad (1)$$

where *Poor*, equals 1 if the worker *i* is living in a poor (or extremely poor) family at time *t*. The explanatory variable of interest is *lnMW$_{sjt}$*, the log of the real hourly minimum wage (in 1999 *Lempiras*) that applies to firm size *s* and industry *j* at time *t*. The coefficient α_1 is an estimate of the effect of one percent increase in legal minimum wage on the probability an individual in the labor 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. We weight the data by the sample weights multiplied by the number of members in the household divided by the number of workers in a household in order to get an estimate of the effect of the minimum wage on individuals in the population and not just workers.[xix] Finally, 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 v. small firms (covered sector) as well as for individuals 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% increase in the minimum wage will lower the probability that an individual is extremely poor by 2.2 percentage points, and may lower the probability that an individual is poor by 0.9 percentage points, although the latter is not statistically significant at conventional levels. The findings in the next rows demonstrate clearly that the decline in poverty and extreme poverty brought about by higher minimum wages is driven entirely by the impact on households with workers in the large private firms, where minimum wages are enforced. In this sector, a 10% increase in the minimum wage will lower the probability that an individual is poor by 1.1 percentage points and that an individual is extremely poor by 2.5 percentage points (both are statistically significant) Since we did not find any compliance with the minimum wage in small firms, it is not surprising that households with workers in this sector are not made better off by minimum wage hikes. Similarly, since the earnings of the self-employed do not seem to be affected by the minimum wage, we should not expect households with these workers to be impacted by minimum wage legislation. Finally, although there is some evidence that wages in the public sector are adjusted upwards with minimum wage increases, the wage levels in this sector are so high that relatively few households that have a wage earner in the public sector are poor and can hence benefit from a minimum wage increase.[xx] In sum, we find households where workers who remain in the large firm sector gain from a minimum wage increase in terms of some leaving poverty.[xxi]

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[TABLE 3 ABOUT HERE]

We next ask whether the findings in the first row of Table 3 hold more strongly for individuals in households with low-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 v. higher pay: i.e., unskilled (people with up to an elementary school education) v. skilled (with more than an elementary school education); heads v. non-heads of households; urban v. rural; male v. female; and younger (15 to 21 years of age) v. 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% increase in the minimum wage reduces the probability that a woman is extremely poor by 3.3 percentage points and poor by 1.7 percentage points whereas the point estimates for men are significantly smaller. This estimate implies that the incidence of extreme poverty among women would be lowered from 43.3% to 40.0%. The one case where poverty reduction is not stronger among the lower paid counterpart is with heads and non-heads of households. The evidence presented in Table 4 suggests that hikes in the minimum wages lower the probabilities that the head of a household is poor or extremely poor at about the same rate that they lower the probabilities that the non-head of a household is poor or extremely poor. Finally, the findings continue to show that minimum wages have more of a significant impact on reducing extreme poverty than poverty.

[TABLE 4 ABOUT HERE]

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In Table 5 we address the question of whether the minimum wage/poverty relationship, continues to hold for individuals in households with low-wage workers within the covered large firm sector, where minimum wages are enforced. The findings show that within large firms, we continue to find the same relationship that we found for the entire population in Table 4, i.e., minimum wages have a larger impact on reducing extreme 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 and their impact on poverty reduction is not significantly different among heads v. non-heads of households but also between men and women in the large firm sector.

[TABLE 5 ABOUT HERE]

6. SUMMARY AND CONCLUSIONS

We conclude from these findings that increases in the minimum wage had a modest poverty reducing effect in Honduras during 2001-2004: a 10% increase in the minimum is associated with a fall in extreme poverty of 2.2 percentage points and a smaller and statistically insignificant decline in poverty (since the 0.9% coefficient estimate is not significant at conventional levels). Checking this with the historical record, we note that minimum wages in Honduras rose by 10.9% over this period; and extreme poverty fell 5.5 percentage points, which is more than the 2.2 percentage point 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 changes in one sector where minimum wages are enforced -- i.e.,

the large firm sector -- where only 20% of the labor force is located.   Minimum wages had an insignificant impact on the poverty of workers in other sectors and their families.

Closer inspection of the relative effects on workers likely to be lower paid v. those likely to be higher paid indicates that within the large scale (formal) sector the poverty reduction effects tend to be larger among those likely to be lower paid. Workers in the rural areas experience the largest poverty reduction impact: A 10% increase in the minimum wage lowers extreme poverty and poverty in rural areas among families of workers in the large scale (formal) sector by 3.9 percentage points.

The finding that Honduras' minimum wage lowers extreme poverty and affects low-wage workers more than high-wage workers is remarkable given how high minimum wages are set, both in terms of the official poverty line and the average wage, and given the received wisdom that minimum wages will have a more positive effect on poverty if they are low relative to living standards. Despite similarly high minimum wages, our findings are contrary those of Arango and Pachón (2006) who show that the minimum wages affect only the middle and upper parts of the income distribution in Colombia, or those of Sagat (2001), who concludes that minimum wages in developing countries do not affect the poorest share of the population. Differences in our and their findings can be due to differences in factors such as the structure of minimum wages (e.g., multiple v. single) and household structure. We suspect that our result is explained in part by the very low female labor force participation rate and large average family size in Honduras such that a single breadwinner earning the minimum wage is supporting a large number of household members at minimum subsistence levels and hence increases in the minimum do impact those in extreme poverty. Moreover, the fact that there is a high

level of extreme poverty in Honduras (close to 50% of the population) and that families in the middle of the income distribution are classified as poor also contributes to our findings.

However, 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 Pages, 2001; Pages 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, 2007a) and Costa Rica (Gindling and Terrell, 2007b), counter to Acemoglu's (2001) theoretical model. We have shown in this paper that increases in minimum wages reduce poverty among workers who remain in the large firm sector but not in the small firm sector or the uncovered sectors. We argue that this is consistent with the following processes: one channel is the result of the wage gain for those workers who retain their jobs in the formal sector and the other channel is that the workers who lose their job from the minimum wage reduction in the formal sector finds a job in the uncovered small firm sector at a lower wage, which can put them in danger of becoming poor.

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 might not have otherwise. 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, in our studies of the impact of minimum wages in Honduras we find no evidence in support of 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 redistributional interventions (e.g., targeted social programs) 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.

[i] 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.

[ii] The period of analysis is circumscribed by the fact that micro data on poverty is not available until 2001.

[iii] See Brown (1999) and Neumark and Wascher (2007) for reviews of the evidence.

[iv] See Neumark and Wascher (2002, pp. 316-318) for an extensive discussion of the assumed elasticities in the literature and the actual measured elasticities for affected workers.

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

[vi] Fajnzylber (2001) and Maloney and Núñez (2003) have found large spillover effects in Latin American countries.

[vii] 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 labor 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.

[viii] The 'fraction affected' is the share of workers whose wage was between the minimum wage in 1990 and the new minimum wage in 1991.

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

[x] We note that because we do not consider poverty rates of households where no members are in the work force (for example, the retired), the measure we present here is comparable but not equivalent to the poverty head count measure, which measures the share of the total population below the poverty line in Honduras.

[xi] The information on the structure of minimum wages was gathered from interviews with staff at the Ministry of Labor and Social Security in Honduras during Jan.-March, 2005 and from a report by the Secretaria de Trabajo y Seguridad Social (2003). Honduras has always had more than one minimum wage

(MW). During 1990-2004, there were more than 22 categories of MWs defined by firm size, industry and, for some years, location. The industry grouping is similar to the one-digit ISIC classification, but there are also special MWs for the exporting sector. From 1990-1995 there were also different MWs for each of three regions: one for the two largest cities (Tegucigalpa and San Pedro Sula) and the department of the Islands of Bahia; one for medium-sized cities; and one for the rest of the country; this was reduced to two regions in 1995-96 (largest cities and other) but has been dropped as a dimension of MWs since then. In assigning minimum wages to workers, we take into account differences by geographic region (in those years we averaged the minimum wage across regions for each industry), but because of lack of data availability we cannot identify export firms. During 1990-1995, when there were different MWs for firms with 1-5 and 6-15 employees, we chose to use the MW decreed for the 6-15 employees as the minimum wage for 'small firms.'

[xii] 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.

[xiii] Unfortunately, we are not able to assign a minimum wage to those outside of the labor force or to unemployed workers who have never worked before. We need to know the firm size and industry of an individual's job to be able to assign the applicable minimum wage. However, since the unemployed who worked before are on average over three-quarters (76%) of all unemployed during the period under study, our results represent the vast majority of the unemployed.

[xiv] However, the annual increases in the average real minimum wage are more erratic and very different when using May to May annual changes (e.g., 15.1% increase between 2001 and 2002; a 5.9% decline in 2002-2003; and a 2.3% rise in 2003-2004) than when using the September to September annual changes (e.g., 0 change between 2001 and 2002 and 6.5% increase between 2002 and 2003). This is primarily a function of when the minimum wage was last raised and how much inflation there was in the interim, and to a lesser extent, changes in the distribution of workers across industry and firms size.

[xv] The World Bank (2006) study notes that at $7/day the Honduran poverty line is also far above the World Bank's $2/day poverty line.

[xvi] We note from Table 1 that the average individual in the labor force has a 0.66 probability of being poor in Honduras, and the probability is higher for those earning the minimum wage.

[xvii] We use a bound of 10% to allow for measurement error so that we are actually measuring the share earning less than 0.9 of the MW, within 0.9 and 1.1 of the MW and more than 1.1 of the MW.

[xviii] We estimate that an increase in real minimum wages of 10% reduces employment by 4.6% in the large firm sector.

[xix] Results using data that is not weighted by household size divided by the number of workers per household are presented in an earlier working paper version of this paper (Gindling and Terrell, 2006). The non-weighted results are similar to those presented in this paper. In calculating the weights we assume that households cannot have more workers than the reported total number of individuals in the household and we put an upper limit on household size of six.

[xx] At the suggestion of a referee, we re-estimated the regressions using household income per capita as the dependent variables (we replicated Tables 3, 4 and 5). The results of the per capita income regressions are consistent with the results of the probits presented in the paper; the coefficients on the minimum wage variables in these regressions are generally positive and significantly different from zero for those workers in the large firm private sector, but are not significant for any other sector.

[xxi] There is the caveat that some workers have become disemployed as a result of the minimum wage increase.

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[APPENDIX TABLE A1 HERE]

Table 1: Per Capita Poverty Rates in Households with Different Types of Workers (avg. for 2001-2004)

Area	Extremely Poor	Poor	Non-Poor	Share of Workers
All	47.7	18.9	33.3	100.0%
Covered Large	24.6	25.7	49.8	20.3%
Covered Small	53.9	17.7	28.4	36.3%
Self-employed	58.8	15.9	25.2	36.2%
Public	12.6	21.0	66.4	7.2%
Unskilled*	54.2	19.4	26.4	67.6%
Skilled**	16.1	21.3	62.6	32.4%
Non-Head	48.5	17.9	33.5	56.6%
Head	47.6	19.1	33.2	43.4%
Rural	64.7	10.0	25.3	48.3%
Urban	30.6	28.0	41.4	51.7%
Female	43.3	20.9	35.8	35.8%
Male	48.9	18.4	32.7	64.2%
Young (15-21)	53.9	18.7	27.4	24.4%
Older (21+)	47.3	18.9	33.7	75.6%

*Unskilled are individuals primary or less education.
**Skilled are individuals with some secondary or higher education.
Source: Authors' calculations from the Honduran Household Surveys, based on worker data weighted by samlpe weights muliplied by the number of household members divided by the number of workers per household.

Table 2: Percent of Workers Earning Within 10% of the Minimum Wage who 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, based on the national poverty line in each year.

Table 3: Impact of an Increase in the Minimum Wage on Poverty and Extreme Poverty: Overall and by Sector of Work

Sample	Extremely Poor	Poor
All	-0.224*** *0.08*	-0.093 *0.071*
Covered Large Firms	-0.251*** *0.06*	-0.114* *0.08*
Covered Small Firms	-0.358 *0.368*	0.155 *0.378*
Self-employed	0.072 *0.406*	0.008 *0.263*
Public Sector	-0.077 *0.159*	0.133 *0.356*

Notes:

a) The table reports the marginal impact of a change in the log of the Minimum Wage on the probability of being poor, based on coefficients estimated with a probit, as specified in the equation in the text, for each sample indicated in the row headings.

b) Regressions use data on members in the labor force (specifically, workers and the unemployed who worked before); they exclude unpaid family workers and workers who report zero or missing earnings or hours worked. Regressions are weighted by sample weights multiplied by the ratio of HHsize divided by the number of HH members in the labor force.

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 4: Impact of an Increase in the Minimum Wage on Poverty and the Extreme Poverty for Sub-Groups in the Labor Force

Sample	Extremely Poor	Poor
Unskilled	-0.260***	-0.110
	0.082	*0.099*
Skilled	-0.175*	-0.103
	0.103	*0.086*
Non-head	-0.199**	-0.065
	0.070	*0.071*
Head	-0.254***	-0.121*
	0.080	*0.071*
rural	-0.482***	-0.361***
	0.084	*0.080*
urban	-0.059	0.063
	0.086	*0.088*
female	-0.332***	-0.166*
	0.106	*-0.061*
male	-0.180**	-0.061
	0.081	*0.072*
young (15-21)	-0.168*	-0.111
	0.102	*0.096*
older (21+)	-0.226***	-0.074
	0.078	*0.070*

Notes:
a) The table reports in each cell the marginal impact of a change in the log of the Minimum Wage on the probability of being poor, based on coefficients estimated with a probit for each sample indicated in the row headings.

b) Regressions use data on members in the labor force (specifically, workers and the unemployed who worked before); they exclude unpaid family workers and workers who report zero or missing earnings or hours worked. Regressions are weighted by sample weights multiplied by the ratio of HHsize divided by the number of HH members in the labor force.

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 Poverty and Extreme Poverty for Sub-Groups of the Labor Force in Large Firms

| Sample	Large Firms	
	Extremely Poor	Poor
Unskilled	-0.347***	-0.302***
	0.069	0.096
Skilled	-0.048	0.056
	0.105	0.117
Non-head	-0.217***	-0.068
	0.060	0.080
Head	-0.257***	-0.155*
	0.061	0.080
rural	-0.385***	-0.394**
	0.109	0.162
urban	-0.157**	0.004
	0.061	0.079
female	-0.215	-0.046
	0.142	0.120
male	-0.258***	-0.164*
	0.057	0.081
young	-0.068	-0.199
	0.134	0.149
old	-0.254***	-0.073
	0.063	0.083

Notes: See Tables 3 and 4.

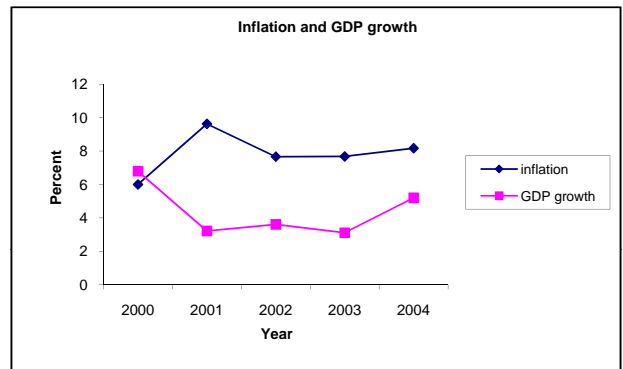**Figure 1: Poverty Rates for Honduras (2001-2004)**
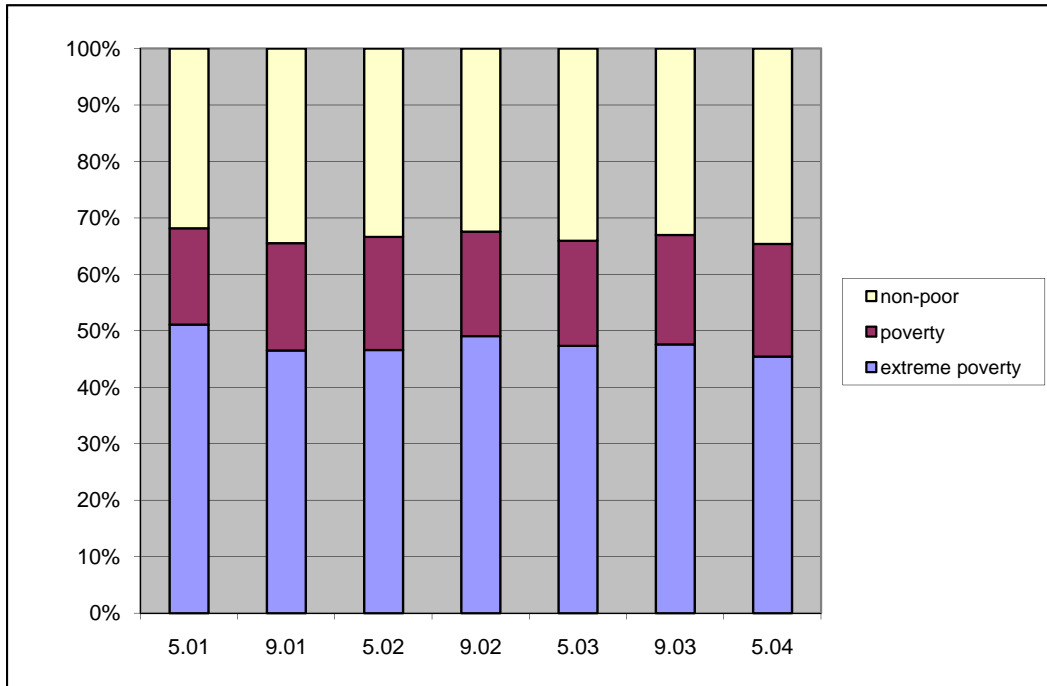
Source: Author's calculations from the Honduran Household Surveys.

Figure 2: Macroeconomic Indicators for Honduras (2000-2004)
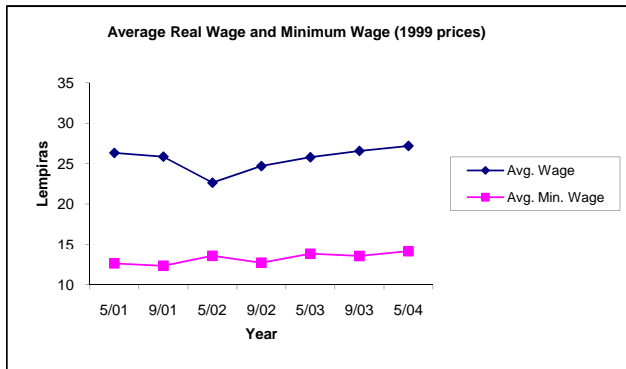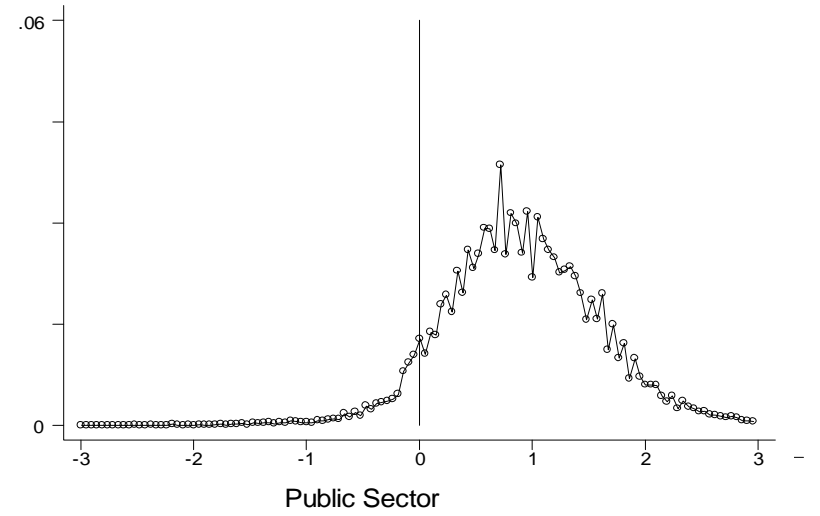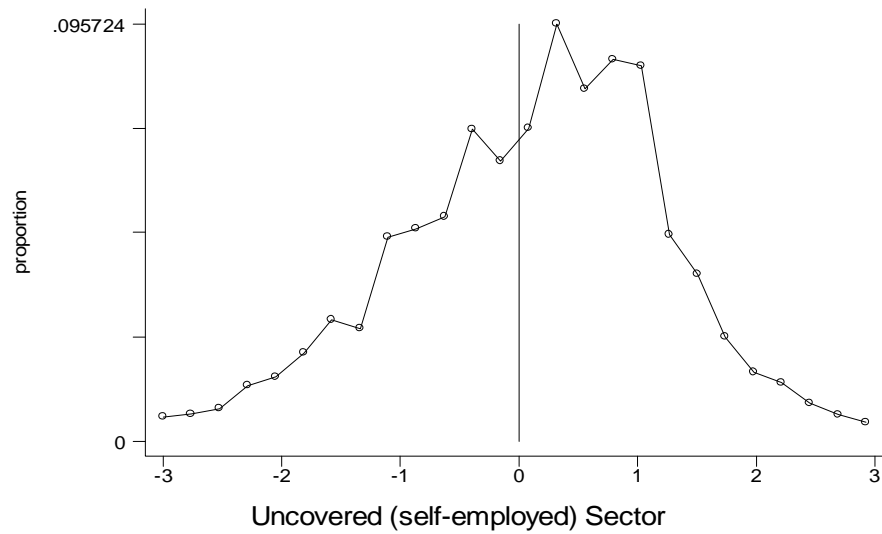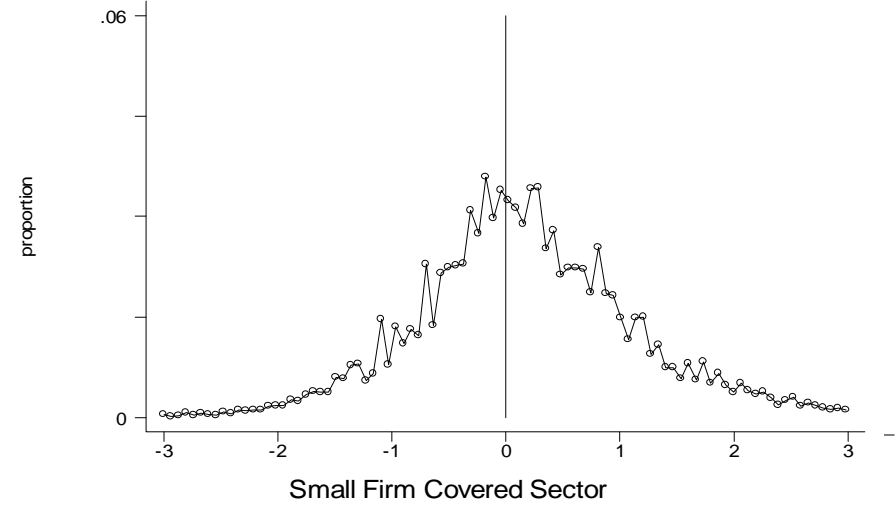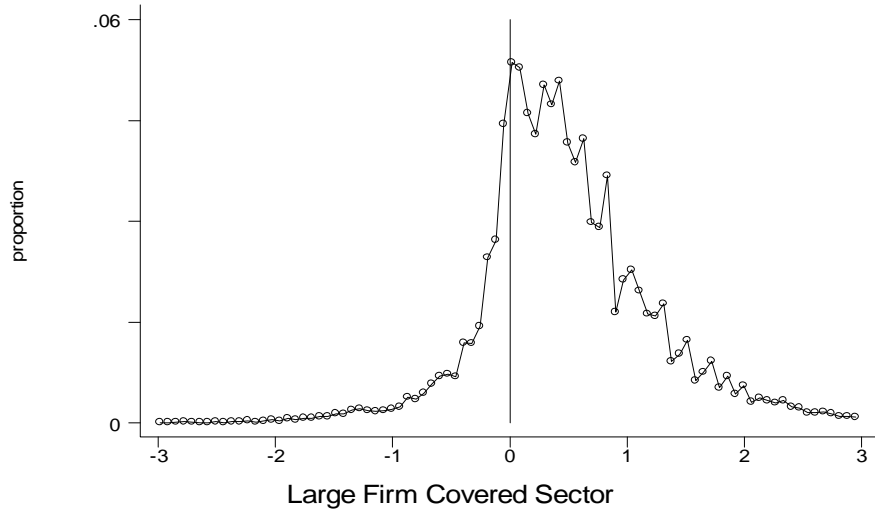

Source: Author's calculations from the Honduran Household Surveys.

Source: Central Bank of Honduras

Figure 3: Kernel Density Distribution of the Log Wage Minus the Log Minimum Wage in Each Sector

Large Firm Covered Sector

Small Firm Covered Sector

Uncovered (self-employed) Sector

Public Sector

Source: Author's estimates from the Honduran Household Surveys.

Table A1: Real Daily Minimum Wage (Dec. 1999 Monthly Prices)

Sector	May_01	Sept_01	May_02	Sept_02	March_03	Sept_2003	May_2004
Agriculture, Hunting and Fishing							
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
Non-Metalic Mining	60.55	59.02	61.03	56.85	61.97	60.34	62.16
Metalic Mining							
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
Manufacturing							
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
Utilities	54.76	53.37	61.03	56.85	61.97	60.34	62.16
Construction							
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
Trade, Hotels and Restaurants							
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
Transptn., Storage and Comm.							
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
Financial Services							
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
Real Estate							
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
Business Services							
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
Communal Services							
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