Improving Compliance with Legal Minimum Wages in Costa Rica[1]

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I. INTRODUCTION

In this paper we will: (i) describe the structure and evolution of legal minimum wages in Costa Rica; (ii) summarize the literature on the impact of legal minimum wages on wages and employment in Costa Rica; (iii) measure the proportion of workers who earn less than the legal minimum wage in Costa Rica; (iii) identify the labor market, personal and family characteristics of sub-minimum wage workers, workers earning at the minimum wage and workers earning more than the minimum wage at any given time; (iv) examine the extent to which sub-minimum wage workers remain sub-minimum wage workers over time vs. the extent to which workers transition from below to above the minimum wage (and vice-versa); (v) identify the characteristics of workers who are at risk of remaining below the minimum wage for extended periods of time; (vi) identify the characteristics of workers who earn above the minimum wage in one time period but who are at risk of falling below the minimum wage in the next period; (vii) identify the characteristics of workers earning below the minimum wage who are likely to move out of sub-minimum wage employment; and finally (viii) examine the relationship between sub-minimum wage employment and poverty. One goal of this analysis is to provide insight into what can be done to reduce the proportion of workers earning less than the legal minimum wage in Costa Rica.

The remainder of this paper is organized as follows. In the next section we review the existing literature on the impact of minimum wages on the distribution of earnings and on employment in Costa Rica and the rest of Latin America. In section III we describe the structure of legal minimum wages in Costa Rica; describing how and for whom minimum wages are set and the evolution of legal minimum wages throughout the last decade. In section IV we examine compliance, and the lack of compliance, with legal minimum wages in Costa Rica, including a careful measure of the proportion of workers who earn less than the legal minimum wage in Costa Rica. In section V we describe the job, family and personal characteristics of workers who earn less than the legal minimum wage. In section VI we use a newly-created panel data set to measure the extent to which sub-minimum wage workers remain sub-minimum wage workers over time vs. the extent to which workers transition from below to above the minimum wage (and vice-versa) and to identify the characteristics of workers who are at risk of remaining below the minimum wage for extended periods of time. In section VII we identify the characteristics of workers who earn above the minimum wage in one time period but who are at risk of falling below the minimum wage in the next period and the characteristics of workers earning below the minimum wage who are likely to move out of sub-minimum wage employment. Section VIII uses the newly created panel data set to examine the relationship between earning below the legal minimum wage and whether a worker's family is in poverty, and specifically tests the hypothesis that a change in the workers wage from below to above the legal minimum wage decreases the probability that a worker's family is poor.

II. LITERATURE REVIEW: WHAT DO WE KNOW ABOUT THE IMPACT OF MINIMUM WAGES ON WAGES AND EMPLOYMENT IN COSTA RICA?

There are several reasons that make Costa Rica an interesting case for the study of minimum wages. First, minimum wages are set at a much higher level compared to the average wage than in the United States and Europe, were most minimum wage studies have been conducted. The relatively high minimum wage relative to average wages implies that the Costa Rican minimum wage will potentially affect more workers, and therefore to have a bigger impact, than in countries where the minimum wage is lower relative to average wages. Second, there is a great deal of variation in minimum wages over time and across workers because minimum wages are changed quite often (twice a year during the period we study) and are set for numerous categories of workers. For example, there are currently more than 12 different categories of minimum wages (depending on the industry, occupation and skill level of the worker). This complex structure of minimum wages is not uncommon in Latin America. Third, there is a large sector of workers, the self-employed, who are not covered by legal minimum wages. This allows us to more precisely identify the impact of minimum wages by comparing the sectors where minimum wages are legally enforced (paid employees, or *asalariados*) with sectors where minimum wages are not enforced. Finally, as we show in our present paper, there is also a large proportion of legally covered sector workers in private sector firms where employers do not comply with minimum wages laws.

In a series of papers, Gindling and Terrell (1995, 2004, 2005 and 2007) estimate the impact of legal minimum wages on average hourly wages, average hours worked, employment, monthly earnings and the distribution of earnings in Costa Rica. These studies conclude that a 10% increase in the real minimum wage leads to an increase in average real wages of 1% in the private covered sector (*asalariados).* That is, the elasticity of the average hourly wage with respect to the minimum wage is approximately 0.1. Gindling and Terrell (2005) find that minimum wage increases have a significant positive impact on average real wages for all covered sector workers, including those in small or large firms, and in urban and rural areas. This is evidence that minimum wages are at least partially complied with throughout the covered sector. On the other hand, increases in the minimum wage have no significant effect on the hourly wages of workers in the uncovered sector (self-employed workers and *patronos*).

In a competitive labor market, increases in wages will cause the quantity demanded of labor by employers to decline, implying that higher legal minimum wages will lead to reduced employment in the covered sector. Gindling and Terrell (2004 and 2007) estimate that a 10% increase in the real legal minimum wage reduces the number of workers employed in the private covered sector in Costa Rica by approximately 1%. In addition to reducing the number of employees, employers may respond to increasing hourly wages by reducing the number of hours worked by employees (by, for example, reducing overtime hours). Gindling and Terrell (2004) estimate the impact of legal minimum wages on the average number of hours worked by those who remain employed in the private formal sector. They find that a 10% increase in the minimum wage led employers to reduce the number of hours worked by their employees by 6%. The negative impact on hours worked counteracts the positive impact on hourly wages, and Gindling and Terrell (2004) estimate that increases in legal minimum wages have no significant impact on average monthly earnings of workers in the private covered sector in Costa Rica. This implies that increases in legal minimum wages may not lead to higher total earnings for workers in Costa Rica, even those who keep their jobs in the private formal sector.

Gindling and Terrell (2004 and 2007) recognize that the impact of legal minimum wages may differ across the distribution, and that the estimated average effects may mask larger changes among workers at different points in the distribution of wages. As a first step in understanding the impact of legal minimum wages on the distribution of wages they plot the distribution of wages and the distribution of minimum wages on the same graphs. The papers by Gindling and Terrell do this for several years in Costa Rica, and find that the distribution of wages in the private covered sector "spikes" at the levels of minimum wages. They interpret this as additional evidence that minimum wages are affecting the distribution of wages among private covered sector workers in Costa Rica. There is no spike in the distribution of wages among self-employed workers, indicating that minimum wages are not directly affecting the wages of workers in the uncovered sector. Further, these figures show that minimum wages are set at levels across the distribution--from the 2rd and 9th deciles in the wage distribution. [2] Gindling and Terrell (2004 and 2007) estimate that legal minimum wages have their biggest effect on workers in the 2nd through 4th deciles in the distribution of expected wages. For these workers, a 10% increase in the real legal minimum wage increases average real wages by 3% (compared to 1% for the average worker across the distribution). However, the negative employment and hours worked effects of a higher legal minimum wage are also largest for the 3rd through 5th deciles. Looking at the impact of legal minimum wages separately for different parts of the distribution of wages, they find some workers who do clearly benefit from an increase in legal minimum wages; higher minimum wages result in higher total earnings (by about 2%) for private covered sector worker in the 3rd and 4th decile of the distribution of expected wages who do not lose their jobs because of the minimum wage increase.

The finding that legal minimum wages do not affect the wages of those in the very bottom or very top of the distribution are consistent with studies using data from Colombia and Nicaragua. In Colombia, Arango and Pachon (2003) find that only households in the 25th to 80th centiles in the distribution of household income benefit from increases in minimum wages. In Nicaragua, Alaniz, Gindling and Terrell (2010) find that increases in legal minimum wages contribute to reduced poverty rates but do not contribute to a reduction in extreme poverty rates.

One problem that exists in many studies of the impact of minimum wages on wages and employment is that minimum wages, wages and employment may be determined simultaneously (endogenously). That is, if those who set minimum wages consider the state of the economy when setting minimum wages, then minimum wages, wages and employment will all rise in times of economic growth, and all fall in times of recession. An advantage of studying the impact of minimum wages in Costa Rica is that changes in the complex structure of minimum wages in the 1980s and 1990s allow the researcher to avoid this endogeneity/simultaneity bias. One way in which this is done in Gindling and Terrell (2004, 2005 and 2007) is by controlling for the average change in the minimum wage by year (which reflect changes in the aggregate economy), so that the wage and employment effects are estimated using only deviations from the average yearly changes in legal minimum wages within each minimum wage category. In addition, changes in the structure of minimum wages in the 1980s and 1990s imply that these deviations from the average yearly changes are truly exogenous to demand and supply conditions in the labor market. Specifically, beginning in 1988 the Ministry of Labor began a gradual process of reducing the existing 506 minimum wage categories to less than 20. This was done by gradually and progressively consolidating minimum wage categories from 1988 to 1997.

[2] The lowest minimum wage is for domestic servants while the highest minimum wage is for workers with a *licenciado* university degree (whose wages fall in the top decile).

Specifically, the Ministry of labor first identified broadly-defined occupational categories that were to be harmonized across industries, and proceeded to gradually increase the lower(est) minimum wage by a greater amount than the higher(est) minimum wage until the harmonized categories had the same minimum wage. At the same time, the industrial dimension of the minimum wage was gradually eliminated, and by 1997 there were only four skill categories (unskilled, semi-skilled, skilled and specialized) with a common minimum wage for all industries and a set of special (generic) minimum wages. This meant that deviations in the minimum wage (after controlling for average changes) over the 1988-1997 period were due to this process of consolidating and reducing the number of legal minimum wage categories, and not related to changes in demand and supply conditions in the labor market.

Existing published studies of the impact of legal minimum wages in Costa Rica show that higher real minimum wages increases the average wage of covered sector workers but also reduces the employment and hours worked of these same workers. Further, legal minimum wages have the largest impact on workers in the bottom half of the distribution (with the biggest impact in the 3rd and 4^{th} deciles in the distribution of expected wages). These results are consistent with those from other studies of the impact of legal minimum wages in Central America and the rest of Latin America. In Central America, Gindling and Terrell (2009) estimate that in Honduras a 10% increase in legal minimum wages leads to a 3% increase in wages and a 4.5% reduction in employment in large covered sector firms. Unlike in Costa Rica, Gindling and Terrell (2009) conclude that legal minimum wages are not complied with in the small firm covered sector in Honduras. Alaniz, Gindling and Terrell (2010) find that in Nicaragua higher legal minimum wages have a significant positive impact on private covered sector wages and a significant negative impact on employment. They show that the impact of minimum wages is largest for workers whose wages are close to the legal minimum. Most workers in Nicaragua who lose their jobs because of higher legal minimum wages either become unpaid family workers or leave the labor force. With respect to Latin America as a whole, a recent review of the literature for Latin America by the World Bank concludes that a 10% increase in minimum wages: (i) raises average wages from 1-6% and reduces employment by approximately 2% (Cunningham, 2007).

III. THE STRUCTURE OF LEGAL MINIMUM WAGES IN COSTA RICA

Minimum wage legislation first appeared in Costa Rica in 1933, when it was established that no worker could receive less than one colon per day (MTSS, 2009). Since 1949, legal minimum wages have been set by the National Salary Council, a tri-partite commission composed of representatives from labor unions, the Chamber of Commerce and the Central Government. The Council issues an executive decree that sets or revises the legal minimum wage and becomes effective when published in the official government diary *La Gazeta*. The process of negotiating, setting and revising minimum wages is largely public, with each side publicizing their demands in the press prior to and during negotiations.

Frequency of adjustments

The first decree fixing minimum wages at the national level was passed in 1952. From this date until 1972, minimum wages were revised every two years, in October. More frequent revisions occurred under special circumstances or when the accumulated inflation rate rose

above 7%. During the inflationary period of the oil crisis of 1974-1979 minimum wages were set each year, in January, as well as changing when the accumulated inflation rate rose above 7%. Since 1980, minimum wages have been set twice a year, first in January then with a revision in June, July or August (in 1982, when inflation reached near 100%, minimum wages were revised three times). During the period of our study (2001-2007), minimum wages were regularly revised twice each year, with new minimum wages becoming effective in January and July.

The covered (protected) and uncovered (unprotected) sectors

Minimum wages in Costa Rica legally apply to all employees (*asalariados*) in private sector firms and in private households—this is the covered sector. Obviously, legal minimum wages cannot be enforced for the self-employed or unpaid family workers—this is the uncovered sector. Also, legal minimum wages do not formally apply to workers in the public sector, who negotiate their own wage structure. For most years and occupations, public sector wages cannot be less than the private sector legal minimum. However, there were some years in which the legal minimum wage for higher skilled and educated workers in the public sector was lower than the legal minimum wage for this group.

Employees (*asalariados*) represent about 70% of total employment in Costa Rica, although this number includes about 14% of workers who are in the public sector. This implies the covered sector (private sector employees) represents a little more than half of all workers (see figure 1). According to data from the Encuesta de Hogares de Propositos Mulitples (EHPM) of the Costa Rican Instituto Nacional de Estadistica y Censos (INEC), private sector employees represented, on average, 56% of all workers during the period that we study, from 2001-2007. Of these private covered sector workers, the proportion of total workers employed by private sector firms has varied between 50% and 54% (with an average of 51%), while an additional 5% of workers are employed as domestic servants in households (see figure 1).

The structure of minimum wages in Costa Rica

The general objective of minimum wage policy is to protect the lowest-paid workers by establishing a wage floor—the lowest wage any worker can be paid—that will guarantee a minimum standard of living for all workers, with the goal of "promoting welfare and a dignified existence" (article 57 of the Political Constitution of Costa Rica) and allowing workers to "cover the normal necesities of his household in the material, moral and cultural spheres" (article 177 of the Labor Code of Costa Rica). A wage floor implies one single value with national coverage that is justified by the criteria of equal rights. In the case of Costa Rica, this type of wage floor is represented by the *minimum minimorum*, or in recent years the minimum wage for unskilled workers. However, this is not the only minimum wage set by the National Salary Council. In practice, a variety of different minimum wages have been set to take into account differences in cost of living by region and differences in worker productivity in different industries, occupations or education/skill levels.

Initially, minimum wages were set by occupation, industry and geographic area. Over time the geographic differences disappeared. Nonetheless, until 1987 different minimum wages continued to be set for over 520 different industry and occupation categories. Beginning in 1987, the Salary Council embarked on a process of gradual simplification of minimum wage categories. Between 1988 and 1990 the industry dimension of minimum wages was eliminated,

and by 1999 this simplification resulted in minimum wages being set for only 23 different occupations and education/skill levels.

During the period under study (2001-2007), the structure of minimum wages by occupation and education/skill level remained constant. Workers are organized into three broad categories. The first group is of occupations associated with the production process (blue collar workers). This group is further divided into four skill categories: unskilled, semi-skilled, skilled and specialized. Minimum wages are set per day. For all but workers in commerce, the weekly minimum wage assumes that workers work six days per week. In commerce, the weekly minimum wage assumes a seven day work week.[3]

The second group, called "generico," applies to white collar or administrative occupations. Minimum wages for this group are set per month, to reflect the independence of such workers to set their work hours. For this group, minimum wages are set for nine different types of workers: the same four as listed previously (unskilled, semi-skilled, skilled and specialized), as well as five categories for workers with technical or university education—those with technical degrees from secondary education, technical university degrees, *diplomados* (2-3 year university degree), *bachilleres* (4-year university degree) and *licenciados universitarios* (5-year university degree).

The third group covers a variety of specific occupations. For example, separate minimum wages are set for domestic servants and reporters. In addition, separate minimum wages are set for coffee and *coyol* harvesters, stevedores, doormen, taxi drivers, beer salesmen, and newspaper delivery personnel. Minimum wages in this group are set for a variety of time periods. For example, minimum wages are set monthly for reporters and domestic servants, daily for production occupations, and per piece or as a percent of revenue for other occupations. With the exception of domestic servants, the workers covered by this third group represent a small proportion of the total work force in Costa Rica.

Figure 2 presents the relative values of minimum wages for different categories of workers in Costa Rica. From July of 1997 to January of 2008, the minimum wages for all categories of workers were adjusted by a common percentage. Therefore, while the absolute value of minimum wages changed during this period, the relative structure of minimum wages between the distinct occupation and skill groups did not change during this period. This implies that for the period we study (2001-2007), the relative values of the minimum wages for different categories of workers shown in figure 2 were the same for each year. It was not until 2008, outside of the period we study, that minimum wages were again adjusted at different rates for different categories of workers. In 2008, minimum wages were increased at the highest rates for the lowest-paid workers--unskilled and semi-skilled workers and domestic servants—significantly reducing the ratio of the highest to lowest minimum wages.

Employment structure by minimum wage category

As part of the research for this project, we compare and match the ocupational classification used by the Household Surveys of Multiple Purposes (EHPM) and the occupational classification from the minimum wage decrees. This allows us to use data from the EHPM to approximate the relative number of employees in the different minimum wage categories. For workers legally covered by the minimum wage legislation (private sector employees), 6% are domestic servants, while the remaining 94% represent employees in private sector firms. Of

[3] Workers in dangerous or unhealthy occupations should also be paid an additional 1/6 of the salary of an unskilled worker.

those employed in private firms, 71% represent occupations in the production minimum wage category and 29% represent occupations in the "generic" minimum wage category. Figure 3 shows the average structure of employment in the private covered sector, divided into production and generic categories of workers.

Among production (blue collar) workers, who represent 71% of total employees in the private sector, employment tends to be concentrated in occupations where workers are less skilled; almost half of all production workers (48%) are classified as unskilled workers and almost two out of every three workers is either unskilled or semi-skilled. On the other hand, within the generic (largely white collar and administrative) minimum wage categories, who represent the remaining 29% of the work force in the private sector, workers tend to be concentrated in occupations that require higher levels of education and skill; 40% of these occupations require higher (tertiary or university) education (i.e. *técnicos, diplomados*, bachelors and *licenciados*), while only 11% of employees in the "generic" categories are classified as unskilled. In the aggregate, the structure of employment in the private sector consists of 37% unskilled workers, 19% semi-skilled, 18% skilled and 11% specialized, with the remaining 15% holding some type of technical or university degree.

Comparing the minimum wage and the mean and median market wage

The relationship between the minimum wage and the mean or median market wage offers an idea about the degree of pressure that minimum wages may exert in the labor market. Since there is a range of minimum wages, we compare market wages to the minimum wage of an unskilled worker (the *minimum minimorum*). We compare the minimum wage for unskilled workers to average wages reported from the Household Surveys for Multiple Purposes and to the reported average wages of the workers who are covered by Social Security health insurance (the *Caja Costarricense de Seguro Social, the CCSS*). Both sources offer data on the mean monthly earnings of workers, although only the Household Survey data provides enough information to identify the occupation of the worker or to calculate median earnings. In comparing monthly market earnings to monthly minimum wages, we assume workers are paid weekly and thus workers get paid for 6 days a week and 26 days a month.

As noted, we use two sources of data for market earnings: the Household Surveys for Multiple Purposes (EHPM) and earnings reported to the Social Security administration. The EHPM are conducted in July of each year, and have data on all types of workers (including the self-employed, owners and those workers who are not insured by Social Security). The Social Security administration has data only on the average earnings paid to employees of firms where employers pay for Social Security health insurance. While data on the salaries of employees covered by Social Security health insurance is available for every month of the year, we consider only the salaries reported in July to maintain consistency with the household survey data. Social Security coverage among the workers considered here, private employees, is very high (around 70%). Nonetheless, it is likely that the data from the Social Security administration (CCSS) represent the formal sector, and therefore reported earnings can be expected to be higher than reported earnings from the Household Surveys.

Figure 4 shows that in 2001 the minimum wage for unskilled workers (the *minimo minimorum*) is equal to nearly 55% of the mean earnings of private sector employees insured by the CCSS. This ratio falls from 2001 to 2003, implying that market wages rose faster than minimum wages during this period. From 2003 to 2006, the ratio rises as market wages rise at a slower rate than minimum wages. It is important to remember that we are comparing the lowest

minimum wage to average wages, so that the actual minimum wage-market wage ratio for an individual worker may actually be higher than 55%. Later, when we compare the minimum wage for different minimum wage classifications with average market wages, we find this to be the case; in agriculture, for example, the minimum wage is approximately equal to the mean wage. In any case, even using the lowest minimum wage, minimum wages in Costa Rica are relatively high compared to other countries, where the minimum wage-average wage ratio ranges between 30% and 40% (Belser, 2009; Marinakis, 2009).

Figure 4 also presents the ratio of the minimum wage for unskilled workers to the mean earnings of private sector employees reported in the Household Surveys for Multiple Purposes. On average, minimum wages represent between 61% and 66% of the average monthly earnings, with an average over all years of 63%. Note that all private sector employees include some workers who work less than full time, and therefore the reported monthly earnings of all private sector employees may be an underestimate of mean full-time monthly earnings. To address this issue, we also compare the minimum wage of unskilled workers to the mean earnings of only full-time employees (those who work between 40 and 48 hours). When this is done, the ratio of minimum wages to mean wages falls some three percentage points to around 60%. To be most comparable to the data from the Social Security administration, we also compare the minimum wage to the reported mean earnings for full-time workers who report that they are covered by Social Security health insurance. When this is done, the ratio of the minimum wage to mean monthly earnings calculated using the Household Survey data is very similar to that calculated using the Social Security data (between 51% and 56%). Thus, calculations using both sources of data, from the Household Surveys and from the Social Security Administration, result in similar minimum wage to mean earnings ratios.

Because the distribution of earnings is asymmetrical, with a large right-hand-side tail, mean earnings may be overstate average earnings. Specifically, because the distribution of earnings has a large right-hand-side tail median earnings, the earnings of the worker in the middle of the distribution, will be lower than mean earnings. As another measure of the pressure that minimum wages impose on the labor market, we also estimate the ratio of the minimum wage to the median wage. Figure 5 presents this ratio using data from the Household Surveys, which permit the comparison.

When we consider all private sector employees, the minimum wage represents between 79% and 84% of the median wage, averaging 81% over all years. This ratio falls slightly (to 78%-84%) when we only take into account full time workers. If we compare minimum wages to the median wage for only full-time private sector employees covered by Social Security insurance, the minimum wage ranges between 71% and 75% of the median wage.

It is necessary to note that domestic servants have a lower minimum wage than the minimum wage for unskilled production workers (which we use as the *minimum minimorum* in figures 4 and 5). The minimum wage for a domestic servant represents only 58% of the *minimum minimorum*. Even if one assumes that a domestic servant receives 50% of salary as in-kind payments (the maximum allowed by law), the minimum wage for domestic servants is still 87% that of unskilled production workers. Not only are minimum wages lower for domestic servants, but so are market earnings. Thus, the minimum wage for domestic servants is 17% higher than the mean earnings, and 28% higher than median earnings (see figure 6). If we consider only domestic servants who work full-time, the minimum wage-mean wage ratio falls to approximately 100% of the mean wage and 94% of the median wage. If we further only consider full-time domestic servants who are have Social Security health insurance, the

minimum wage is approximately 76% of mean earnings and 80% of median earnings. Low minimum wages and low compliance with minimum wages in the private household sector appear to be themes that require attention.

Comparison of minimum wages and market earnings by industry sector

Minimum wages do not differ between industries but only between occupations (and skill levels). Therefore, any differences in a the minimum wages-mean wage ratio between industries will exist only because of the different occupational mix between industries. The higher the proportion of unskilled workers in an industry, the lower the average market wage and the closer to the *minimum minimorum* will be mean and median wages.

In figure 7 we show the ratio of minimum wage to mean earnings for full-time private sector employees in three representative industries (agriculture, commerce and transport). The minimum wage-mean earnings ratio is highest in agriculture, where the mean wage is approximately equal to the minimum wage for an unskilled production worker (the *minimum minimorum*). The minimum wage-mean earnings ratio for full-time private sector employees in agriculture ranges from 98% to 106%, depending on the year studied. After agriculture, restaurants and hotels, commerce and construction have the highest minimum wage-mean earnings ratio; on average the minimum wage for an unskilled worker is equal to 73% of the mean wage in restaurants and hotels, 68% in commerce and 69% in construction. Finally, we can identify three industry sectors (not shown in figure 7)—manufacturing, transport and real estate/services to businesses—where the minimum wage varies between 49% and 59% of mean earnings.

If we compare the minimum wage of unskilled workers to median wages, the relative differences between industries remain the same, although the minimum wage-median wage ratio is, generally, higher than the minimum wage-mean wage ratio. Specifically, in agriculture the minimum wage for unskilled workers is 8% higher than the median wage, indicating that more than half of full-time private sector employees in agriculture earn less than the lowest minimum wage. In commerce and tourism, the minimum wage-median earnings ratio is, on average, about 85%; in construction the *minimum minimorum* is 80% of the median wage; in manufacturing the ratio is 75%; in transport, and real estate and services to businesses the ratio varies between 60% and 70%.

Minimum wages and the market earnings by minimum wage (occupational) groups

Because minimum wages are defined for different occupational categories, and because in our study we carefully match the occupational categories in the minimum wage decrees with the occupational categories available in the Household Surveys for Multiple Purposes, we are able to use the Household Surveys to explicitly study the relationship between occupation specific minimum wages and mean and median market earnings for these specific occupational categories. Table 1 summaries the ratio of the minimum wage to both mean and median earnings for the occupational categories in the minimum wage decrees.

The top four occupational categories in table 1 correspond to production occupations, while the bottom four categories correspond to "generic" occupations. The results presented in table 1 suggest that the minimum wages for the least skilled workers (unskilled, semiskilled, skilled and specialized) come very close to the market wage. For these four groups, the minimum wage is equal to between 82% and 97% of the mean wage and between 90% and 100.9% of the median wage. The minimum wage is highest, relative to mean and median wages,

for unskilled workers, where minimum wages are 97% of mean wages and more than 110% of median wages. This suggests that a significant proportion of workers are earning less than the legal minimum wage that applies to their specific occupation.

For the four groups that represent more-skilled and educated workers, the ratio of the minimum wage to the mean and median wages are lower than for less-skilled workers. That is, the mean and median market wage for more-skilled workers is higher, relative to the minimum wage, than it is for less-skilled workers. For example, the minimum wage for bachelors (university) is 63% the mean wage and 78% the median wage, while the mean and median wages for licenciados are almost twice the minimum wage.

In any case, because the largest proportion of employees in private firms are in lower-skilled occupations, this suggests that the minimum wage exerts substantial pressure on the low-skilled labor market. Further, the higher minimum wage relative to mean and median wages is consistent with the significant degree of non-compliance with minimum wage laws in Costa Rica that we find later in the paper.

The evolution of real minimum wages in Costa Rica

The evolution of the real minimum wage in Costa Rica is determined by the magnitude of the changes in the nominal minimum wage and by the evolution of the inflation rate, which we approximate using the consumer price index (2006=100). Although in theory revisions of the minimum wage should take into account labor market and macroeconomic conditions as well as inflation, in recent years revisions in the minimum wage have been based solely on estimates of the inflation rate. This is because of a consensus agreement (*acuerdo de concertación*) worked out by the Rodriguez administration in 1999, whereby it was agreed that minimum wages would be adjusted twice a year, and that all minimum wages would be automatically increased (with no negotiation) by the same percent as the change in the consumer price index since the last minimum wage change (provided that the six-month inflation rate had not increased by more than 6%, in which case the increase was to be negotiated).[4] In practice, since 2000 every minimum wage setting (except for the second semester of 2008) has simply increased all minimum wages by the accumulated inflation rate since the last minimum wage change. This changed only in the second semester of 2008, when for that minimum wage setting only minimum wages were increased at a faster rate for unskilled and semi-skilled workers than for all other occupations.

Because during the period for which we have data (2001-2006) each nominal minimum wage was increased by the cumulative rate of inflation since the last change, real minimum wages tended not to change very much. Under such a scheme, real minimum wages will tend to increase if inflation is accelerating and to decrease if inflation is decelerating. In addition, because all minimum wages increase by the same percentage, the relative minimum wage between different occupational categories stayed the same throughout the period.

Figure 8 presents the evolution of the real mean monthly minimum wage for each of the past 15 years for different minimum wage categories. Real minimum wages expanded strongly between 1995 and 1999 (by approximately 12% for an unskilled worker and 11% for a skilled worker), and then remained basically unchanged between 1999 and 2006 (because during the period when the *acuerdo de concertación* was in effect, all minimum wages were automatically

[4] Although the consensus agreement also contemplated other variables that should be considered when setting the minimum wage, in practice the only thing considered between 2000 and 2007 was the inflation rate. The consensus agreement also specified the method by which the inflation rate was to be measured.

increased proportional to the inflation rate, and inflation was stable). During the second half of 2006 and in 2007, and again in 2009, the real minimum wage increased as the result of decelerating inflation. Between 2006 and 2009 the real minimum wage increased by 6.1% for an unskilled and semi-skilled workers, and 2.7% for all other workers, reflecting the decelerating inflation rate and the role of the special adjustment made in the second semester of 2008.

In summary, figure 8 verifies that, after significant increases between 1995 and 1999, the *acuerdo de concertación* led to stagnant real minimum wages between 1999 and 2008. Real minimum wages only increased substantially again in 2009, due to decelerating inflation and a special adjustment made in the second semester of 2009.

Macroeconomic context

We have noted that during the period under study (2001-2007) all minimum wages were adjusted twice a year based on the accumulated inflation since the last minimum wage, the result of a consensus agreement (*acuerdo de concertación*) worked out by the Rodriguez administration in 1999. During this period, minimum wages stagnated, increasing at an average annual rate of only 0.3%. The 2001-2007 period was also one of stability in the macroeconomy and labor market; between 2000 and 2007 the real mean earnings of covered sector workers increased by approximately 0.5% per year. This compares to a period of rapid growth prior to the years for which we have data; between 1996 and 1999 mean real earnings increased by 4.2%, according to the Household Surveys. In the past two years (2008 and 2009) real wages again increased, this time due to the strong deceleration in inflation caused by external factors. Unexpectedly, accelerating inflation and higher real wages accompanied the global economic crisis begun in 2008 and declining economic growth in Costa Rica; Gross domestic Product per capita in fell by 0.5% in 2008-2009.

As noted, real earnings in the sector covered by minimum wage legislation, private sector employees, follow a similar pattern to that of real minimum wages; growing in 1996-1999, stagnating from 2000-2007, and then increasing from 2008-2009. This suggests that legal minimum wages may be affecting the changes in the mean real wage, a conclusion that is supported by the literature cited in the last section. A similar pattern of real earnings changes can be found in the public sector, which suggests that minimum wage adjustments may be part of a broader salary policy on the part of the central government. On the other hand, real earnings of the self-employed, the uncovered sector, show a different pattern; falling in both the 1996-199 and 2000-2007 periods, and then increasing in 2008-2009. This suggests that minimum wages may not have the same effect on salaries in the covered sector as they do in the covered sector. This also is consistent with the literature on the impact of minimum wages in Costa Rica that is reviewed in the last section.

IV. COMPLIANCE WITH LEGAL MINIMUM WAGES IN COSTA RICA

Legal and institutional background

As we have noted, all private sector employees are legally covered by minimum wage legislation in Costa Rica; in our empirical work we therefore define the covered sector to include all private sector employees (*asalaridos del sector privado*). Legal minimum wages apply both to employees in private sector businesses and to household employees such as domestic servants. The legally uncovered sector includes self-employed workers (19% of workers on our sample, on

average, from 2001 to 2007) and unpaid family workers (2.8% of workers in our sample), sectors where minimum wages obviously cannot be enforced.[5] Legal minimum wages also do not apply to public sector workers, who are paid according to a different pay scale (although the wages of almost all public sector workers in almost all years are equal to or higher than the legal minimum wage in the private sector).

Enforcement of minimum wage laws is generally considered to be stronger in Costa Rica than in many other developing countries. Enforcement is carried out by inspectors of the Ministry of Labor, through complaints made by workers to the National Directorate of Work Inspection, and through workers directly bringing a case against an employer to the labor court. A recent report written in this Directorate summarizes enforcement activity during the period of our study (Vargas Fernandez, et al., 2009). 13370 inspections were carried out in 2000. The number of inspections remained high from 2000 through 2004, and then fell dramatically from 2004 through 2007, to 8669 in 2007 (see table 3). These numbers imply that between 6.2% to 4.1% of all firms in Costa Rica were inspected in each year from 2001 to 2007.[6] As a comparison, Weil (2005) reports that the annual likelihood that a firm will be inspected in the United States is less than 10%. The majority of these inspections (above 50% in 2007) were carried out in commerce, 15.7% in services, 22.7% in manufacturing and 11.4% in agriculture. Detailed analysis of the results of these inspections is reported in Vargas Fernandez, et al., (2009) for the years 2000 and 2007. Inspectors found violations of at least one labor market regulation in over 95% of the firms inspected in 2007, and violation of minimum wage laws in 39% of firms inspected (table 3).[7] In 2007, violations of minimum wage laws were most common in agriculture, followed by manufacturing, services and commerce (in that order). When a violation is found, initial inspections by the Ministry of Labor are followed up *visitas de revision* to verify that employers have fixed the problem. Analysis of the results of these *visitas de revision* in 2000, 2005 and 2007 shows that approximately 76% of employers are fully compliant with labor regulations at the time of these follow-up visits, suggesting that Ministry enforcement activity is at least partially effective. However, it is also clear that in Costa Rica compliance with minimum wage laws is not universal—some workers, even in the covered sector, earn less than the minimum wage.

If the *visitas de revision* find that the violations of labor regulations continue, they can refer the case to the labor courts, who can then impose fines. The effectiveness of the labor courts is limited, however, by the length of time it takes to render a judgment, generally two to three years. Employees can also bring a case directly to the labor courts against an employer, without the intermediation of the Ministry of Labor. However, workers must pay their own court costs, can at most recover back pay owed because of the violations of the labor code (no additional damages are awarded, and judgments generally take two to three years. Few such cases are brought.

The fall in the number of inspections from 2004 through 2007 coincided with, and was partly caused by, a decrease in resources for inspections at the Ministry of Labor. This decrease

[5] In this section, the self-employed include those who report being owners of firms (*patronos*). Both groups are in the uncovered sector, and in practice, many *patronos* are owners of very small firms and it is difficult to distinguish them from those who report being self-employed.

[6] The number of firms is estimates using the number of owners of firms (*patronos*) reported in the Household Surveys for Multiple Purposes in each year.

[7] Other common violations of labor regulations include work permission paperwork (*comprobante de trabajo*) (44.9% in 2007), not paying for Work Risk (worker compensation) insurance (39.7%), emergence exits (39.7%), and not paying social security insurance (33.5%).

in resources resulted in a decrease in the number of inspectors, lack of means of transportation and office equipment, an increase in the responsibilities of the remaining inspectors as the number of other workers (principally office workers) in the directorate also decreased, the proliferation of specialized "niche" inspections (related to pregnancy, teenage workers, union freedom, gender discrimination, etc.), and an increase in the complexity of the process of administration (Vargas Fernandez, et al., 2009).

Another way to construct information on compliance is to calculate the average share of workers earning less than the minimum wage, near the minimum wage, or more than the minimum wage. However, there are several complications with comparing the wages of an individual worker with the legal minimum wage that applies to that worker. One set of difficulties relates to measuring wages, the other set of difficulties is related to determining which minimum wage applies to an individual worker. Limitations of the earnings measure that we use have been discussed in a previous section. Below we discuss the difficulties with assigning each worker a legal minimum wage.

As we have seen, during the years for which we have data, the structure of legal minimum wages in Costa Rica was very complex. Legal minimum wages are set for three broad categories of workers: one set of minimum wages for non-professional workers, one set for "*genericos*" (largely professional) categories of workers and another set of "special" minimum wages. For non-professional workers, four different minimum wages are set for: unskilled workers, semi-skilled workers, skilled workers and specialized workers. The definition of skill is determined by the occupation and industry of the worker in regulations promulgated by the Ministry of Labor. Minimum wages are set for "*genericos*" (largely professional) workers in the following categories: unskilled workers, semi-skilled workers, skilled workers, technicians with a secondary degree, specialized workers, technical workers with a tertiary education, "*diplomados*" with a university degree, a 4-year university "*bachiller*" degree, and those with a 5-year university "*licenciado*" degree. Special minimum wages are set for coffee harvesters, domestic servants, reporters and stevedores.

To assign a legal minimum wage to each worker in our data, we take the legal minimum wages from the official decrees of the Minimum Wage Council. Every worker in our data set is assigned a legal minimum wage based on his/her skill level, education level, occupation and industry. The assignment of a legal minimum wage to a worker is based on a comparison of the skill, education, occupation and industry classifications used in the Household Surveys for Multiple Purposes and the detailed skill, occupation and industry categories in the regulations regarding minimum wages issued by the Ministry of Labor. The definitions of the categories differs between the Household Surveys and the Ministry of Labor, although both are very detailed. Therefore, despite the care taken at this stage, it is possible that we made errors in this process, and assigned some workers in our data the wrong legal minimum wage.

Another difficulty with assigning a legal minimum wage is related to part-time workers. Most legal minimum wages in Costa Rica are specified as monthly earnings for full-time workers. The legal work week in Costa Rica is defined as 8 hours per day, 6 days per week (48 hours per week). Despite this, many private and public sector employers and workers consider 40 hours per week (8 hours per day, 5 days per week), to constitute a full-time job. If workers are paid weekly, they must be paid as though they were working 6 days per week (even if they

may work fewer than 48 hours per week).[8] For workers who are paid by the day (*jornada)*, the daily minimum wage is defined in the legislation as the monthly minimum wage divided by 30.[9] For workers who work less than 8 hours per day, employers are required to pay part time workers a salary proportional to the number of hours and days that they work. In our calculations, for workers who report that they work full time or more (40 hours per week or more), we compare the monthly earnings reported by the worker to the monthly legal minimum wage for a full-time worker. For part-time workers (who work fewer than 40 hours per week), earnings are adjusted to the full-time equivalent wage (assuming that they were working 8 hours per day and 6 days per week), and this imputed "monthly" salary is compared to the monthly legal minimum wage.

Proportion of Workers Earning Below the Minimum Wage, by Sector of Employment

Previous studies have shown that the proportion of workers earning less than the legal minimum wage in Costa Rica is large. For example, Trejos (2009) estimates that in the 1999-2008 period, approximately 25% of workers covered by legal minimum wages earn less than the lowest minimum wage (*minimum minimorum*). Using data from 1988 through 2000, Gindling and Terrell (2007) estimate that approximately one-third of covered sector workers earn less than the minimum wage that applies to their occupation and skill level. In an earlier study, Gindling and Terrell (1995) estimate that, depending on the year considered (1976 through 1991), 26 to 42 percent of workers in Costa Rica earned less than the minimum wage applicable to their industry of employment. Gindling and Terrell (1995) further find that workers with the following characteristics are more likely to earn below the minimum wage: part-time workers, women (vs. men), secondary family workers (vs. household heads), teenagers and older workers (70+), less educated workers, workers in small firms, and workers who live in rural areas outside of the Central Valley.

Tables 4 and 5 present our estimates of the average share of workers earning less than the minimum wage and near the minimum wage for different years and types of workers (the remainder earn more than the minimum wage). To address potential mis-measurement of the wage and minimum wage, 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 minimum wage, within 0.9 and 1.1 of the minimum wage and more than 1.1 of the minimum wage.

As noted above, errors could be made in assigning to each worker an individual minimum wage that applies to that specific worker. To address this issue, we calculate two sets of numbers; one where we compare the wage of a worker to his/her individually-assigned legal minimum wage and another where we compare the wage of a worker to the *minimum minimorum* wage—the lowest minimum wage (excluding domestic servants) for unskilled workers in each year. We exclude domestic servants from these calculations because the legal minimum wage law assumes that domestic servants receive some of their wage as payments-in-kind, and therefore sets a lower monetary minimum wage for domestic servants than for other unskilled private sector workers.

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[8] Workers who work more than 48 hours per week are required to be paid an over-time wage premium (1.5 times the regular salary). In this work, we are concerned with compliance with the legal minimum wage laws and not other parts of the labor code, so we will not consider over-time wage premia in our calculations.

[9] From the *Decreto*, June 2000: *"Artículo 7°—Regulación de formas de pago: si el salario se paga por semana, se debe de pagar por 6 días, excepto en comercio en que siempre se deben pagar 7 días semanales en virtud del artículo 152 del Código de Trabajo. Si el salario se paga por quincena comprende el pago de 15 días, o de 30 días si se paga por mes, indistintamente de la actividad que se trate."*

By our calculations, approximately 30% of all workers (who report non-zero earnings) earn less than the legal minimum wage that applies to their occupation and skill level.[10] This is consistent with the data from Ministry of Labor inspections, which showed that 39% of firms inspected were violating minimum wage legislation. The proportion of workers earning below the minimum wage is 28% in 2001, falls to 27% in 2003, and then rises to 33% in 2006 before falling again in 2007 (table 4). The increase in the proportion of workers earning less than the minimum wage between 2004 and 2006 occurred at the same time that the number of inspections carried out by the Ministry of Labor was being reduced. After remaining relatively steady (at around 13,000) from 2001 through 2004, the number of inspections fell steadily from 2004 to 2007 (falling to 8669 in 2007).

One reason why workers might earn less than the legal minimum wage is that they work in the uncovered sector, where the legal minimum wage does not apply. As we can see from table 5, the proportion of workers in the uncovered sector (self-employed workers) earning below the minimum wage is higher than the proportion of covered sector (private sector paid employees) earning less than the minimum wage. 34.0% of self-employed workers earn less than the minimum wage, while only 29.9% of private sector paid employees earn less than the legal minimum wage. However, the number of workers who work in jobs legally covered by minimum wage legislation (paid employees in private sector firms) and who report earning less than the legal minimum wage is still very high. Again, it is clear that there are many workers earning less than the minimum wage in Costa Rica, even in those sectors legally covered by minimum wage legislation. If we consider separately paid employees in medium/large firms (presumably the formal sector with 20 or more employees), small firms (6-19 employees) and microfirms (2-5 employees), we find the proportion of full-time workers earning less than the legal minimum wage is 21% for workers in medium/large firms, 30% for workers in small firms, and 44% for workers in micro firms. In addition, the proportion of domestic servants who report earning less than their minimum wage is larger than for employees in small firms or for self-employed workers (36% of domestic servants report earning less than the legal minimum wage). This suggests that workers in those jobs traditionally considered part of the "informal sector" are more likely to earn less than the minimum wage than those in larger, formal sector, firms. Similarly, workers in rural areas are more likely to earn less than the minimum wage compared to urban workers (38% vs. 25%).

The number of workers earning below the legal minimum wage includes part-time workers who are earning less than the imputed hourly minimum wage. It is likely that there are more potential measurement errors when we consider part-time workers compared to full-time workers. For example, in imputing a full-time equivalent monthly earnings for each worker, we calculate an hourly wage by dividing the monthly earnings by reported hours worked per week (multiplied by 4.3 weeks per month). Potential incompatibility between the reported monthly earnings and reported weekly hours measures may create measurement error. To address this issue, we also calculate the proportion of full-time (40 hours per week or more) workers who are earning less than, or near, the monthly legal minimum wage. When we do this, the proportion of full-time workers earning less than their individual minimum wage is 29%, as large as when we consider part-time workers also. That is, potential mis-measurement of the wages of part-time workers is not an important reason for the large measured proportion of workers earning less than the legal minimum wage in Costa Rica.

[10] By excluding those who do not report earnings (or report zero earnings), we are excluding all unpaid family workers from our calculations.

As we have mentioned, part of the reason why we may find that workers earn less than the legal minimum wage is that we may be assigned them a legal minimum wage (based on their self-reported occupation and skill level) that is too high. To address this issue, and to construct a lower bound on our estimate of the proportion of workers earning less than the legal minimum wage, we also calculate the proportion or workers who earn less than the *minimum minimorum* wage (these calculations exclude domestic servants). When we do this, our calculations of the proportion of workers earning below the legal minimum wage does fall—compared to the *minimum minimorum*, 19.5% of all workers, and 17.2% of full-time workers, report earning less than the legal minimum wage. While the proportion of workers earning less than the *minimum minimorum* wage is less than the proportion earning less than the individual minimum wage, the proportion is still substantial; the proportion of private covered sector workers earning less than the *minimum minimorum* is 19% (10% in medium/large firms, 18% in small firms and 35% in microfirms).

One additional interesting result seen in table 5 is that the proportion of workers earning at or near the individually-assigned legal minimum wage is much higher than the proportion of workers earning at or near the *minimum minimorum*. This suggests that when setting wages, employers consider the individual minimum wage that applies to each worker based on that worker's occupation and skill level, and do not simply apply the *minimum minimorum* to all workers (despite the fact that the press often reports the *minimum minimorum* as "the" legal minimum wage).

Our results suggest that, even accounting for potential measurement error, there is still a substantial proportion of workers (including covered sector workers) who are paid less than the legal minimum wage in Costa Rica. It has been suggested in the literature that sub-minimum wage work is associated with informal sector employment. There is some evidence for this hypothesis from the results presented in table 5. A much higher proportion of paid employees in small firms and in domestic service (two job characteristics generally associated with "informality") earn less than the legal minimum wage when compared to paid employees in large firms or in the public sector (generally associated with the "formal" sector). Although the definition of informal sector employment is controversial, one characteristic that is in many definitions is that employers are in the informal sector in order to evade labor market regulations such as minimum wage laws and non-wage payments such as Social Security insurance. To explore this relationship we calculate the proportion of workers earning below the legal minimum wage only for those workers who are also insured by the Social Security system through their jobs (that is, where Social Security insurance is paid by the employer or provided through the work contract (*convenio*)). The results of these calculations are presented in panel B of table 5. Comparing panels A and B of table 5 shows that the proportion of covered sector workers who earn less than the legal minimum wage is much smaller if we consider only those workers whose employers also pay for Social Security insurance. However, another conclusion one can take from panel B of table 5 is that, even using a very narrow definition of formality (full-time private sector paid employees in large firms whose employers pay for Social Security insurance), there is still a large proportion of workers earning less than the legal minimum wage (20% below the individual minimum wage, and 8.5% below the *minimum minimorum*.)

The proportion or workers earning less than the minimum wage in Costa Rica is similar to the proportion of workers earning less than the legal minimum wage in other Central American countries. Gindling and Terrell (2009) estimate that 30.6% of private covered sector workers in Honduras earn less than the minimum wage applicable to their industry of

employment. Alaniz, Gindling and Terrell (2010) estimate that 23.2% of private covered sector workers in Nicaragua earn less than the minimum wage applicable to their industry of employment, and Oliva, Trigueros and Gindling (2010) estimate that 33% of covered sector workers in El Salvador earn less than the minimum wage. In a World Bank review of the impact of minimum wages in Latin America, Cunningham (2007) notes that there are subminimum wage workers in all latin American countires. The proportion of workers earning less than the legal minimum wage ranges from less thyan 1% in Uruguay to 45% in Paragua. According to Cunningham (2007), the proportion of workers earning below the legal minimum wage in Costa Rica is around the median for Latin American countries. Even in the United States, where minimum wage legislation is relatively well-enforced, a substantial number of workers earn less than the minimum wage. For example, Weil (2005) examined a 2000 Department of Labor survey of the apparel industry in Los Angeles and concluded that 27% of workers were paid less than the legal minimum wage (Weil, 2005).

Comparing the Distribution of Wages and Legal Minimum Wages

Another straightforward method to check for compliance with the legal minimum wage is to look for spikes in the wage distribution at or around the minimum wage. Given the multiple minimum wages in Costa Rica (and to make the figures comparable to those we construct in Nicaragua and El Salvador), we simplify the graphical analysis by plotting the kernel density estimate of the log of monthly earnings minus log of the individual monthly minimum wage for full-time workers. In these figures a zero indicates that the worker is earning the legal minimum wage. We construct these figures for different sectors (the covered private sector, the public sector, and the uncovered self-employed sector) to test for different levels of compliance. We also construct these figures separately for medium/large, small and micro firms in the covered private sector.

The kernel density estimates are presented in figure 9; all graphs have the same scale to make comparisons between sectors easier. If legal minimum wages are complied with in a particular sector then we should see the distribution of earnings censored at the minimum wage (that is, few people should earn below the minimum wage) and we should see a spike in the distribution of earnings at the minimum wage (as workers who would earn below the minimum wage see their wages rise to the minimum wage).[11] Figure 9 presents evidence that legal minimum wages are complied with in the private covered sector, where there is a spike in the distribution of earnings at the legal minimum wage and some evidence of censoring in the distribution of wages below the legal minimum (although there are still many workers, even in the covered sector, who earn less than the legal minimum). The evidence in strongest that legal minimum wages are enforced in medium/large firms in the covered sector; for workers in these firms there is a clear censoring of the wage distribution below the minimum wage and a clear spike in the wage distribution around the minimum wage. There is less evidence that minimum wages are complied with in the small and micro firms in the covered sector. For example, while there is a spike in the distribution of wages at the minimum wage among workers in micro firms, there is no obvious censoring of the distribution below the minimum wage. The distribution of

[11] We also constructed figures similar to those in figure 1 comparing earnings to the *minimum minorum* wage. When we do this, there is no noticeable spike in the distribution at the *minimum minorum*. This suggests that skilled and educated workers are likely to be paid the individual minimum wage that applies to them, and not the *minimum minorum* wage.

earnings in the uncovered sector also exhibits a spike in the distribution at the legal minimum wage, but there is no evidence of censoring in the distribution below the minimum wage.

Our analysis of the proportion of workers earning below and at the minimum wage suggested that workers in firms where employers pay for Social Security insurance are more likely to be paid at or above the minimum wage. In figure 10 we present kernel density estimates of the difference between the log wage and log of minimum wage for workers in covered sector firms whose employers pay for Social Security insurance. As expected, there is evidence from these graphs that minimum wages are complied with in such firms. Unlike in figure 11, the graphs in figure 12 suggest that minimum wages are complied with in such firms even among small and micro enterprises.

To further explore the relationship between minimum wages and the distribution of wages we plot, for 2007, the distribution of the log of salary overlaid with lines indicating the legal minimum wages for different categories of workers (figure 11). As is clear from this graph, minimum wages in Costa Rica are set throughout the wage distribution. The lowest minimum wage, that for domestic servants, falls in the second decile of the distribution while the minimum minimorum falls in the third decile of the salary distribution. The highest three minimum wages are for those workers with university education. The highest, the minimum wage for *licenciados*, falls in the 9th decile of the distribution of salaries.

Table 6 shows the proportion of workers in each decile of the salary distribution earning below, at or above the individual minimum wage. Most workers who earn the minimum wage fall in the middle, the 3rd through 6th decile, of the salary distribution. A smaller precent of workers, presumably domestic servants, in the 2nd decile (5%) earn the minimum wage. Most workers in the 2nd decile earn less than the legal minimum wage. Similarly, a smaller percent of workers in the 7th through 9th deciles in the wage distribution, presumably professionals with university degrees, earn the legal minimum wage. Most workers in the 7th through 9th deciles in the wage distribution earn more than the legal minimum wage applicable to their skill level, education level, occupation and industry.

V. CHARACTERISTICS OF MINIMUM WAGE AND SUB-MINIMUM WAGE WORKERS—ECONOMETRIC ANALYSIS

Both analysis of the data, and the results of inspections by the Ministry of Labor, lead us conclude that, even when we use a narrow and strict definition of the covered formal sector, a substantial number of workers earn less than the legal minimum wage in Costa Rica. It is therefore useful to understand who these workers are, and how the characteristics of these workers compare to the characteristics of workers who earn at or above the minimum wage.

To identify the characteristics associated with earning below, near and above the legal minimum wage, we divide workers into three categories: those earning below 90% of the minimum wage, those earning within 10% of the minimum wage, and those earning above 110% of the minimum wage. We define a categorical variable with three values depending on which of these categories characterizes an individual worker. We define two such variables: in one we compare the wage to the individual minimum wage that applies to each worker in each year; in the other we compare the wage to the *minimum minimorum* in each year. These two variables (both denoted $ATMW_{ijt}$) are the dependent variables in a logit estimation of the following equation:

$$Prob(ATMW_{ijt}) = f(\alpha_{oj} + a_{1j} JOB_{it} + a_{2j} X_{it} + \sum_{t=1}^{T} \gamma_{jt} YR_t + \mu_{ijt}) \quad (1)$$

The parameters of this equation for each category, j, of ATMW are estimated using the logit technique (the function f(*) denotes the logistic distribution) and the pooled 2001 through 2007 Household Surveys for Multiple Purposes, where i = individual and t=year. From the results of the estimated logit equation, we calculate the "marginal effect" of each explanatory variable on the probability that a worker earns below the minimum wage or at the minimum wage (this is calculated for a worker with mean of each explanatory variable). The results of these estimations are presented in tables 7 and 8.

The explanatory variables in this regression include a set of time dummy variables, YR_t, that capture changes in each year that are common to each individual, such as changes in enforcement effort by the Ministry of Labor, survey design, changes in the aggregate economy, changes in the average minimum wage, etc. JOB_{it} is a vector of job characteristics and X_{it} is a vector of individual and family characteristics. The job characteristics include the following dummy variables that are equal to one if the worker: is self employed; is insured by Social Security; is in the public sector; is a domestic servant; works part-time; is a paid employee in a small firm or micro firm; receives payment-in-kind; belongs to a union; or belongs to a solidarity organization. Job characteristics also include dummy variables indicating the industry of employment (finance, which has a low proportion of workers earning below the minimum wage, is the reference sector). Individual characteristics include the region where the worker lives, gender, years of education, age dummy variables and whether the worker is an immigrant. Family variables include dummy variables indicating the position in the family (spouse, household head, other family member—household head is the reference category), whether the family is a single-parent household, and the number of young children in the family.

Econometric Results: Variables that Explain the Probability That a Worker Earns Below the Minimum Wage

Table 7 reports the change in the probability that a worker earns less than the minimum wage given a change in each independent variable, controlling for the other independent variables and evaluated at the mean values of the independent variables. A positive coefficient in table 7 indicates that a worker with this characteristic is more likely to earn below the minimum wage compared to the average worker, while a negative coefficient indicates that a worker with this characteristic is less likely to earn below the minimum wage when compared to the average worker. For example, our results suggest that the probability that a self employed worker earns less than the individual minimum wage is 12 percentage points higher than for paid employees (*asalariados*). We report the results of the estimate of these equations using the two definitions of the dependent variable and run separately for all workers and for only private covered sector workers.[12] In general, our results are similar whether we look at all workers or only private sector workers.

i) Job characteristics

Workers with the following job characteristics are significantly more likely to earn below both the individual legal minimum wage and the *minimum minimorum* (the coefficients on these variables are statistically significant): self-employed workers (the uncovered sector), paid employees (*asalariados*) in a micro firms and small firm, if the worker is not insured by Social Security, full-time workers (compared to part-time workers), workers who do not receive payment

[12] Because public sector workers are covered by a separate wage schedule, we do not consider the public sector as part of the sector covered by minimum wage legislation in Costa Rica.

in kind, workers who do not belong to a union or solidarity organization and industry of employment (the industry variables are significant as a group). Whether the worker is a domestic servant is not a significant determinant of whether or not a worker earns less than the legal minimum wage. Public sector workers are more likely to earn less than the individual minimum wage but less likely to earn less than the *minimum minimorum*.

Because the independent variables that measure job characteristics all use the same units (they are all dummy variables) we can compare the magnitudes of the coefficients on these variables to determine which are the quantitatively most important correlates of who is likely to earn less than the legal minimum wage. Ignoring for the moment the industry of employment, the most important job characteristics in determining whether a worker earns below the minimum wage (the variables where the coefficients have the largest absolute values) are: whether the worker is self-employed; whether the worker is employed by a micro or small firm; whether a worker is insured by Social Security; whether the worker works full time; and whether the worker belongs to a solidarity organization. For example, the probability that a worker without Social Security insurance earns less than the minimum wage is 16 percentage points higher than for workers who do receive Social Security insurance, the probability that a self-employed worker earns below the legal minimum wage is 12 percentage points higher than the probability that a paid employee earns less than the minimum wage, while a worker in a micro firm is 17 percentage points more likely to earn less than the minimum wage compared to a worker in a large firm. Compared to a worker with no affiliation, the probability that a worker who belongs to a union earns less than the legal minimum wage is 6 percentage points lower and for a worker in a solidarity organization the probability is 10 percentage points lower. It is interesting to note that belonging to a solidarity organization has a bigger impact than belonging to a union. Among industries, workers in agriculture are more likely to earn below the minimum wage than are workers in any other industry sector. The next most likely workers to earn below the minimum wage are mining, manufacturing and personal services. Workers in finance (the omitted category), construction, transportation and utilities are least likely to earn below the minimum wage.

Summarizing our results relative to job characteristics, workers in the uncovered sector are more likely to earn less than the minimum wage, as are workers whose jobs have the characteristics of the "informal" sector (micro fims and small firms, agriculture, working for employers who do not pay for Social Security insurance, and workers who do not belong to a union or solidarity organization). There were also some unexpected results. Part-time workers are less likely to earn less than the legal minimum wage than are full-time workers. Holding other factors constant, the probability that a part-time worker earns below the individual minimum wage is 17 percentage points lower than for a full-time worker. While this result may be partly due to measurement error (recall the problems with measuring wages and minimum wages for part-time workers), it may also suggest that workers are willing to accept a lower wage in exchange for stable, full-time work. Other unexpected results are that workers who receive payment in kind are less likely to earn below the minimum wage, and that public sector workers are more likely to earn less than the individual minimum wage (although less likely to earn less than the *minimum minimorum*). This last result may reflect the fact that, for several years, public sector wages for some high skill occupations were set at a level lower than the minimum wage in the private covered sector.

ii) Personal characteristics

Workers with the following individual characteristics are significantly more likely to earn below both the individual legal minimum wage and the *minimum minimorum:* workers in rural areas, less-educated workers, women, and the youngest workers (teenagers) and oldest workers (60

years or older). The impact of these characteristics is large. For example, the probability that a women earns less than the minimum wage is 10 percentage points higher than for men, the probability that a teenager earns less than the minimum wage is 11 percentage points compared to 40-49 year old workers, and each additional year of education decreases the probability that a worker earns less than the minimum wage by 1 to 2%. Workers in regions outside of the Central Valley are more likely to earn less than the minimum wage compared to workers in the Central Valley (the reference sector in the regression). The two regions where workers are most likely to earn less than the minimum wage are Brunca and Chorotega. Immigrants are not more likely to earn less than the legal minimum wage than natives.

iii)Family characteristics

Household heads are less likely to earn less than the minimum wage than other working household members; compared to the household head (the reference category), spouses and other working member of the family are significantly more likely to earn less than the minimum wage. Families with more young children (13-18 years old) living at home, and members of single parent households, are also more likely to earn less than the minimum wage. These last two characteristics are associated with an increased probability that the family is in poverty, and suggests a relationship between poverty and earning below the minimum wage. We explore this relationship in more detail in a later section.

iv) Time dummy variables

The estimated coefficients on the time dummy variables (reference category 2001), allow us to conclude that, controlling for other factors, the proportion of workers earning less than the minimum wage was significantly higher in the 2004-2007 period than the 2001-2003 period. This is consistent with the results shown in table 4, and provides additional evidence that the reduction in the number of inspections by the Ministry of Labor from 2004 to 2007 contributed to an increase in the number of workers earning less than the minimum wage in Costa Rica.

iv) Summary

The econometric results presented in table 7 suggest that providing sub-minimum wage workers with human capital such as education or training is an effective way to increase their wage to levels above the legal minimum wage. The results also suggest that enforcement of minimum wage legislation by the Ministry of Labor matters; the proportion of workers earning less than the minimum wage increases as the number of inspections of firms by the Ministry of Labor decreases. Further, the results suggest that if the Ministry of Labor wants to reduce the number of workers earning less than the legal minimum wage, the most effective policies would focus on enforcement in micro firms, outside of the Central Valley, in firms where workers are not represented by an organization such as a union or solidarity organization, in agriculture, and in firms with a disproportionate number of women and very young or very old workers.

Econometric Results: Variables that Explain the Probability That a Worker Earns At or Near the Minimum Wage

Table 8 reports the change in the probability that a worker earns within 10% of the minimum wage given a change in each independent variable (controlling for the other independent variables), evaluated at the mean values of the independent variables. A positive coefficient in table 8 indicates that a worker with this characteristic is more likely to earn within 10% of the minimum wage compared to the average worker, while a negative coefficient indicates that a worker with this characteristic is less likely to earn within 10% of the minimum wage when compared to the average worker.

i) Job characteristics

Self-employed workers are significantly less likely to earn that minimum wage than are paid employees (*asalariados*). On the other hand, we have seen that self-employed workers are more likely to earn less than the minimum wage. These two results are consistent with the fact that paid employees are covered by legal minimum wage legislation (this is our definition of the covered sector) while self-employed workers are not covered by minimum wage legislation. It is further evidence that minimum wages are not complied with in the uncovered (self-employed) sector.

There are no statistically significant differences in the probability that a worker earns the individual minimum wage between paid employees (*asalariados*) in medium/large, small and micro firms. This result is consistent with the results of Gindling and Terrell (2004a), who conclude that minimum wages have an impact on all paid employees (*asalariados*) in Costa Rica, whether they work in large, small or micro firms. It is significantly more likely that workers in micro and small firms (compared to large firms) earn within 10% of the *minimum minimorum.*

Workers whose employers pay for Social Security insurance are also more likely to earn within 10% of the minimum wage, compared to the average worker. This is evidence that these two characteristics of formality (earning the minimum wage and participating in Social Security) are linked.

The impact of other job characteristics on the probability that a worker earns the minimum wage are similar to the impact of these characteristics on the probability that a worker earns less than the minimum wage. Specifically, the following job characteristics are significantly more likely to earn at or below both the individual legal minimum wage and the *minimum minimorum*: full-time workers (compared to part-time workers), workers who do not receive payment in kind, and workers who do not belong to a union or solidarity organization and industry of employment (the industry variables are significant as a group). Whether the worker is a domestic servant is not a significant determinant of whether or not a worker earns the legal minimum wage. Whether a worker is in the public sector is not a significant determinant of whether a worker earns the individual minimum wage. There are no clear differences in the proportion of workers earning at the minimum wage between industries.

ii) Personal characteristics

Workers with the following individual characteristics are significantly more likely to earn within 10% of the individual legal minimum wage and the *minimum minimorum:* workers in rural areas, less-educated workers, women, and the youngest workers (teenagers and 20-19 year old workers). These are characteristics that are correlated with low skills and low wages, and is evidence that legal minimum wages disproportionately affect low skilled workers in Costa Rica. Workers 30 years and older are more likely to earn higher wages, and therefore are significantly less likely than younger workers to earn within 10% of the minimum wage. Whether a worker is an immigrant is not a significant determinant of whether the worker earns the minimum wage.

iii)Family characteristics

Compared to household heads or spouses, other working family members are significantly more likely to earn within 10% of the minimum wage. These "other" family members are likely to be children living at home. The number of young children living at home, and whether the worker lives in a single parent household, are not significant determinants of whether a worker earns near the individual minimum wage (although workers in single parent households are more likely to earn within 10% of the *minimum minimorum).*

iv) Time dummy variables

Unlike the results for the probability that a worker earns less than the minimum wage, there are no clear patterns across years in the probability that workers earn with 10% of the minimum wage.

VI. CHARACTERISTICS OF MINIMUM WAGE AND SUB-MINIMUM WAGE WORKERS—DESCRIPTIVE ANALYSIS

Table 9 presents the proportion of workers who earn below 90% of the individual minimum wage, within 10% of the minimum wage, and above 110% of the minimum wage with selected job, personal and family characteristics. These numbers indicate whether it is more or less likely that a worker with each characteristic earns below, at or above the legal minimum wage. For example, if the proportion of workers earning below the minimum wage who are self-employed workers is larger than the proportion of self-employed workers earning within 10% of the minimum wage or above the minimum wage, then this is evidence that self-employed workers are more likely to earn less than the minimum wage compared to the average worker. Unlike the regression results presented in the last section, these data do not control for other characteristics. However, the results presented in table 9 are consistent with the conclusions derived from the econometric analysis.

Characteristics of Workers Who Earn Below the Minimum Wage

i) Job characteristics

In terms of job characteristics, compared to workers earning at or above the minimum wage, the probability that a worker earns below the minimum wage is much higher if the worker: is self-employed; works in a microfirm (with 2-5 workers) compared to a medium or large firm; works for an employer who does not pay for Social Security insurance; works in the private sector (compared to the public sector); is a domestic servant; and is not represented by a union or solidarity organization. These are all characteristics of the "informal" sector. Regarding industry of employment, an agricultural worker is more likely to earn below the minimum wage than workers in any other industry.

ii) Personal characteristics

Workers with the following individual characteristics are more likely to earn below the minimum wage when compared to workers who earn at or above the minimum wage*:* workers in rural areas, less-educated workers, women, the youngest workers (teenagers) and the oldest workers (60 years or older). Workers in regions outside of the Central Valley are also more likely to earn below the minimum wage (compared to workers in the Central Valley). Immigrants are not more likely to earn less than the legal minimum wage compared to the average worker.

iii)Family characteristics

Spouses and other working member of the family are more likely to earn less than the minimum wage, compared to household heads. Families with more young children living at home, and members of single parent households, are also more likely to earn less than the minimum wage.

Characteristics of Workers Who Earn Above the Minimum Wage

With a few exceptions, the characteristics of workers likely to earn above than the minimum wage are the opposite of the characteristics of those likely to earn less than the minimum wage.

i) Job characteristics

In terms of job characteristics, compared to workers earning at or below the minimum wage, workers who earn above the minimum wage are more likely to be workers with the following characteristics: works in a medium or large firm (with 20 or more workers); works for an employer who does pay for Social Security insurance; works in the public sector; and is represented by a union or solidarity organization. These are all characteristics of the "formal" sector. The impact of self-employment is more complicated. Self-employed workers are less likely to earn above the minimum wage than below the minimum wage. On the other hand, self-employed workers are more likely to earn above the minimum wage than earn within 10% of the minimum wage. This may be because the self-employed constitute a varied group of both high paid and low paid wokers; some self-employed workers are highly-educated professionals (and so earn high wages), while others are less-educated informal sector workers who earn very low wages.

ii) Personal characteristics

Workers with the following individual characteristics are more likely to earn above the minimum wage*:* workers in urban areas, more-educated workers, men, and workers between 30 and 49 years old. Workers in the Central Valley are also more likely to earn above the minimum wage compared to workers in other parts of the country.

iii)Family characteristics

Household heads are more likely to earn above the minimum wage compared to spouses or other family members. On the other hand, families with more young children (13-18 years old) living at home, and members of single parent households, are less likely to earn above than the minimum wage.

Characteristics of Minimum Wage Workers (Who Earn Within 10% of the Minimum Wage)

i) Job characteristics

First, we start by describing how minimum wage workers differ from both workers earning below the minimum wage and workers earning above the minimum wage. Workers earning near the minimum wage are more likely to be paid employees (*asalariados*) than are those earning either below or above the minimum wage. This is consistent with the fact that paid employees are covered by minimum wage legislation, while self-employed workers are not. Compared to workers earning below or above the minimum wage, workers earning the minimum wage are more likely to work in small (6-19) and medium/large firms vs. micro firms. Workers earning the minimum wage are also more likely to work full-time compared to workers earning below or above the minimum wage. Therefore, our results suggest that, compared to average workers, workers who earn near the minimum wage are likely to be full-time, paid employees in small (6-19 employees) firms.

Next, we compare workers earning at the minimum wage to those who earn below the minimum wage. Compared to workers earning below the minimum wage, minimum wage workers are more likely to work for employers who pay for Social Security insurance, to work in the public sector, to work full-time, and to be represented by a union or solidarity organization, and less likely to be a domestic servant.

Finally, we compare workers earning at the minimum wage to those earning above the minimum wage. Compared to those who earn above the minimum wage, minimum wage workers are less likely to be represented by a union or solidarity organization, to work in the public sector, or to be insured by Social Security.

ii) Personal characteristics

Compared to the individual characteristics of those who earn above the minimum wage, the characteristics of minimum wage workers are generally similar to the characteristics of workers below the minimum wage. Specifically, compared to those earning above the minmum wage, minimum wage workers are more likely to be women, have less education, live in rural areas and outside of the Central Valley, and to be younger workers.

iii)Family characteristics

Compared to the family characteristics of those who earn above the minimum wage, the characteristics of minimum wage workers are generally similar to the family characteristics of workers below the minimum wage. Specifically, minimum wage workers are likely to be have more children and live in a single parent family, and less likely to be a household head.

VII. HOW OFTEN AND WHY DO WORKERS MOVE FROM BELOW TO ABOVE THE MINIMUM WAGE (AND VICE-VERSA)?

How often do workers move from below to above the minimum wage (and vice-versa)?

We have shown that in any given year a substantial number of workers earn less than the legal minimum wage in Costa Rica, even in those sectors legally covered by minimum wages. We have also examined the characteristics of workers who, at any given time, earn less than the minimum wage. One issue that we have not yet examined is whether those workers who earn below the minimum wage today are able to escape sub-minimum employment. Our concern about sub-minimum wage workers will depend on whether workers who earn below the minimum wage are stuck in below minimum wage employment or whether there is substantial movement of workers into and out of sub-minimum wage employment. The first case may indicate that sub-minimum wage workers constitute a permanent underclass of workers, while the later case may indicated that sub-minimum wage employment is simply a temporary stop on the ladder to a good job.

We are able to study the transitions of workers from below to above the minimum wage in Costa Rica because of the panel data set we constructed for this project. A research team comprised of Luis Oviedo of the Institute for Research in Economic Sciences at the University of Costa Rica and members of the Costa Rican Institute of Statistics and Census (INEC), in consultation with T. H, Gindling and Juan Diego Trejos, worked together to create individual-level panel data using the annual *Household Surveys for Multiple Purposes* carried out by the Costa Rican Institute of Statistics and Census. The household surveys have been conducted in July of every year since 1976 on approximately 1% of the population. There is a rich set of variables on a large number of households and workers (approximately 10,000 households and 40,000 individuals) each year. A panel data set of individuals from 2001 to 2007 was created.

The sample for the *Household Surveys for Multiple Purposes* is carried out on a rotating basis, where all those in a given dwelling (*vivienda*) are surveyed for four consecutive years and then rotated out of the sample. Hence we are able to observe the same household and individual for up to four points in time. The 2001-2007 household surveys contain a variable that identifies the same dwelling from one year to the next. There may be multiple households within a dwelling, or different household may occupy a dwelling in different years. Once the same dwelling is identified, whether or not the households in the dwelling are the same from one year to the next is determined on the bases of variables such as gender of household head, marital status of household members, family composition (relation to the household head), etc. This

makes it possible to match households across any two years. A variable was created to uniquely identify the same households across multiple years. Because there is no variable identifying the same individuals from one year to the next, matching individuals within households across surveys is more complicated than matching households. By comparing the characteristics of individuals (gender, age, marital status, relation with head of household, etc.) within each household in different years, it was possible to identify the same individuals from year to year in the surveys. Using this methodology, we can match approximately 60% of all observations across at least two years. In the resulting sample, we observe the same 69,960 individuals in at least two years: 30,066 individuals at least three times and 11,655 four times. Of the working age population (12 years and older), we are able to match 55,303 individuals in at least 2 years, 26,064 individuals at least three times, and 10,593 individuals four times.

This panel data set is used to construct the numbers in table 10. The first column of table 10 presents the average proportion of workers in our sample who earn less than the minimum wage vs. at or above the minimum wage at any point in time, t. As we saw in table 10, on average, 29.6% of workers earn less than the minimum wage in any given year. The first row of the second column of table 10 presents the proportion of workers (for the sample of workers whom we observe in at least two years) who earn below the minimum wage two years in a row, compared to those workers who earned below the minimum wage in one year and then at or above the minimum wage the next year (row two of column 2). Row 2 of column 2 therefore presents the proportion of total workers who are able to escape sub-minimum employment within one year. As is clear from a comparison of these two figures, about one-half of those workers who earned less than the minimum wage in one year earn more than the minimum wage the next year. That is, 1/2 of the workers who earn the minimum wage in any one year are able escape sub-minimum wage employment within one year. The second row of the third column presents data on the proportion of sub-minimum wage workers in a given year who escape sub-minimum wage employment within two years, while the second row of column 4 presents data on the proportion of sub-minimum wage workers in a given year who are able to escape sub-minimum wage employment within 3 years. As is clear from a comparison of these numbers, by the third year, over 75% of the sub-minimum wage workers in a given year have been able to escape sub-minimum wage employment. Clearly, there is substantial mobility of workers out of sub-minimum wage employment. At the same time, there is still a significant fraction of workers, approximately 6% of all workers, who remain stuck in sub-minimum wage employment for at least three years (and 3.8% of all workers who remain below the *minimum minimorum* for at least three years). This 6% of workers is an estimate of the proportion of workers who constitute a "permanent" sub-minimum population.

While it is true that a substantial number of workers transition from below to above minimum wage employment, it is also true that at the same time a similar number of workers transition from above to below the minimum wage. For example, the data from column 2 of table 10 show that over one year the proportion of workers who transition from at or above to below the minimum wage is approximately equal to the proportion who transition from below to above, leaving the proportion of workers earning below the minimum wage in any given year the same. That is, on average 29.6% of workers earn less than the minimum wage each year, but only about half of these workers were earning below the minimum wage the year before (or will earn below the minimum wage one year later), and only about ¼ of these workers will still be earning below the minimum wage in three years.

As noted, we may be most concerned about the workers who appear to constitute a permanent underclass of workers who remain below the minimum wage for many years. Next, we examine the characteristics of these workers. We may also be concerned about those workers who earn at or above the minimum wage but are at risk of falling below the minimum wage. Therefore, we also examine the variables that influence whether a worker earning at or above the minimum wage in one year will fall below the minimum wage the next year. Finally, we would like to know what characteristics help sub-minimum workers escape sub-minimum employment. Therefore, we also examine the variables that characterize those workers who are able to escape sub-minimum wage employment.

Characteristics of workers who earn below the minimum wage in more than one year

Table 11 presents the characteristics of workers who remain below the minimum wage for at least two years, compared to those who escape sub-minimum wage employment, who remain at or above the minimum wage for at least two years, or who earn at or above the minimum wage in one year and below the minimum wage in other years. Compared to the average worker, workers who remain below the minimum wage for at least two years are more likely to be: self-employed, work in a micro firm, not represented by a union or solidarity organization, not insured by Social Security, work as a domestic servant and work in agriculture. In terms of individual characteristics, workers likely to remain below the minimum wage for at least two years are likely to live in rural areas and outside of the Central Valley, are more likely to be women, to be less educated and to be very young (teenagers) or very old (60 or above). In terms of family characteristics, workers likely to remain below the minimum wage for at least two years are not heads of households, live in families with more young children and live in single parent households. In summary, the characteristics of workers who are likely to remain below the minimum wage for at least two years are the same as those that characterize workers who earn less than the minimum wage in any one year.

Variables that influence whether a worker earning at or above the minimum wage in one year will fall below the minimum wage the next year

Next, we estimate equations that explore the variables that characterize the workers at risk of falling below the minimum wage. That is, the variables that influence the transition from at or above the minimum wage in one year to below the minimum wage in the next. First, using the sample of workers who earn at or above the minimum wage at time t, with the Probit technique we estimate

$$Prob(ABOVETOBELOWMW_{it} = 1) = \beta_o + \beta_1 JOB_{it} + \beta_2 X_{it} + \sum_{t=1}^{T} \gamma_t YR_t + \mu_{it}, \quad (2)$$

The dependent in equation (2) is a dummy variable (ABOVETOBELOWMW) that is one if worker i transitions from earning at or above the minimum wage in time t to earning below the minimum wage in time t+1, and zero if the worker earns at or above the minimum wage in both t and t+1. The independent variables are the same job, individual and family characteristics as those in equation (1), defined at time t.

Table 12 reports the impact of each independent variable on the change in the probability that a worker who earns at or above the minimum wage in time t falls below the minimum wage in time t+1. A positive coefficient in table 12 indicates that a worker with this characteristic at time t is more likely to be at risk of falling below the minimum wage, while a negative coefficient

indicates that a worker with this characteristic is more likely to remain earning at or above the minimum wage. For example, our results suggest that the probability that a worker who earns at or above the minimum wage at time t earns below the minimum wage at time t+1 is 6 percentage points higher than for self-employed worker compared to paid employees (*asalariado*).

i) Job characteristics

Workers with the following job characteristics are significantly more likely to be at risk of falling below the minimum wage: self-employed workers, workers in micro or small firms, workers whose employers do not pay for Social Security insurance, part-time workers, workers who do not belong to a union or solidarity organization, and domestic servants. Ignoring for the moment the industry of employment, the job characteristics most likely to put a high wage worker at risk of falling below the minimum wage (the variables with the largest coefficients) are if the worker is a domestic servant, works part-time or is self-employed (in that order). It is interesting to note that, while part-time workers are less likely to earn below the minimum wage at any given time, part-time workers who earn more than the minimum wage at time t are very much at risk of falling below the minimum wage at time t+1. In terms of industry of employment, the workers most at risk of falling below the minimum wage work in the industries of agriculture, manufacturing, commerce, hotels, real estate and personal services. Except for part-time employment, the job characteristics that put a high wage worker at risk of falling below the minimum wage are the same as the characteristics of workers who already earn below the minimum wage.

ii) Personal characteristics

Workers (who currently earn above the minimum wage) with the following individual characteristics are significantly more likely to be at risk of falling below the minimum wage*:* workers in rural areas, less-educated workers, women, the youngest workers (teenagers and 20-29 year old) and the oldest workers (60 years or older). Workers in regions outside of the Central Valley are more likely to be at risk of falling below the minimum wage compared to workers in the Central Valley (the reference sector in the regression). Immigrants are not a significant determinant of whether a worker falls below the minimum wage. It is interesting to note that the individual characteristics that put a high wage worker at risk of falling below the minimum wage are the same as the characteristics of workers who already earn below the minimum wage.

iii)Family characteristics

Household heads are less likely to be at risk of falling below the minimum wage than other working household members; compared to the household head (the reference category), other working member of the family are significantly more likely to fall below the minimum wage. Again, it is interesting to note that the family characteristics that put a high wage worker at risk of falling below the minimum wage are the same as the characteristics of workers who already earn below the minimum wage.

iv) Time dummy variables

The estimated coefficients on the time dummy variables (reference category 2001), allow us to conclude that, controlling for other factors, the probability that a worker earning at or above the minimum wage at time t falls below the minimum wage at time t+1 is significantly higher for in the 2004-2005 period than the 2001-2003 period. This provides additional evidence that the reduction in the number of inspections by the Ministry of Labor from 2004 to 2007 had an impact on whether or not workers earned less than the minimum wage, and contributed to an increase in the number of workers falling below than the minimum wage in Costa Rica.

v) Summary

We have examined the characteristics of workers who earn less than the minimum wage in any given year, the characteristics of workers who remain below the minimum wage for more than one year, and the characteristics of workers who earn at or above the minimum wage in one year but fall below the minimum wage in the next year. The characteristics of these three groups of vulnerable workers are similar. Specifically, these vulnerable workers are more likely to be self-employed workers, workers in micro or small firms, workers whose employers do not pay for Social Security insurance, workers who do not belong to a union or solidarity organization, domestic servants, and workers employed in agriculture. Further, vulnerable workers are more likely to be workers living in rural areas and outside of the Central Valley, to be less-educated, women, the youngest workers (especially teenagers) and the oldest workers (60 years or older). Vulnerable workers are also less likely to be household heads, more likely to live in single parent households and more likely to live in households with young children. The results also suggest that enforcement of minimum wage legislation by the Ministry of Labor matters; the proportion of workers earning less than the minimum wage, and the number who initially earn more than the minimum wage but fall below the minimum wage in the next year, increase as the number of inspections of firms by the Ministry of Labor decreases.

Variables that influence whether a worker earning below the minimum wage in one year will earn at or above the minimum wage the next year

We have examined the characteristics of workers who earn or who are vulnerable to earning less than the minimum wage. But we have also seen that there is a substantial proportion of workers who are able to escape sub-minimum wage employment. It would be useful to know who these workers are. Next, we estimate equations that estimate which the variables characterize the workers who escape minimum wage employment. Using the sample of workers who earn at or above the minimum wage at time t, with the Probit technique we estimate

$$Prob(BELOWTOABOVEMW_{it} = 1) = \beta_o + \beta_1 JOB_{it} + \beta_2 X_{it} + \sum_{t=1}^{T} \gamma_t YR_t + \mu_{it}, \quad (3)$$

The dependent variable in equation (4) is a dummy variable (BELOWTOABOVEMW) that is one if worker i transitions from earning below the minimum wage in time t to earning at or above the minimum wage in time t+1, and zero if the worker earns below the minimum wage in both time t and time t+1. The independent variables are the same job, personal and family characteristics as those in equations (1) and (2).

Table 13 reports the change in the probability that a worker who earns below the minimum wage in time t earns at or above the minimum wage in time t+1. A positive coefficient in table 13 indicates that a worker with this characteristic has a higher probability of leaving sub-minimum employment, while a negative coefficient indicates that a worker with this characteristic is more likely to remain earning below the minimum wage. For example, our results suggest that the probability that a worker who below above the minimum wage at time t is able to rise above the minimum wage at time t+1 is 7 percentage points lower than for self-employed worker compared to paid employees (*asalariado*). That is, paid employees (*asalariados*) in time t are more likely to escape sub-minimum wage employment in time t+1 compared to self-employed workers.

i) Job characteristics

Workers with the following job characteristics are significantly more likely to escape sub-minimum wage employment within one year: paid employees (*asalariados*), workers in large firms (20 or more employees), and workers whose employers pay Social Security insurance. Domestic servants are less likely to escape sub-minimum employment. These results suggest that workers in formal sector jobs are more likely to be able to escape sub-minimum wage employment than worker in the informal sector. Compared to workers in finance, workers in all other industries are less likely to escape sub-minimum employment. The workers least likely to escape sub-minimum employment work in agriculture, manufacturing and services. Whether a workers works part-time, receives payment in kind, is protected by a union or solidarity organization or works for the public sector are not statistically significant influences on the ability of a worker to escape sub-minimum wage employment.

ii) Personal characteristics

Workers with the following individual characteristics are significantly more likely to escape sub-minimum employment*:* workers in urban areas, worker with more education, and men. Age also seems to play a role: younger workers (up to 49 years old) who earn below the minimum wage are more likely than older workers older workers (50 and above) to escape sub-minimum wage employment. Immigrant status is not a significant determinant of whether a worker escapes sub-minimum wage employment.

iii)Family characteristics

Household heads and spouses are more likely to escape sub-minimum wage employment compared to other family members. The number of small children and whether a worker lives in a single parent household are not significant determinants of whether a worker escapes sub-minimum employment.

VIII. POVERTY

One reason to be concerned about sub-minimum employment is that it could be associated with poverty. If this is the case, better enforcement of minimum wage legislation could reduce poverty (although better enforcement of minimum wages may also cause some low wage workers to lose their jobs). In this sub-section we test whether transitions from sub-minimum jobs to employment that pays at or above the legal minimum wage is correlated with a reduction in poverty. Note that these transitions could occur either because workers change employers or because the wage of workers changes for those who remain with the same employers.

In the next exercise, we estimate the impact of a worker transitioning from earning below to above the minimum wage (and vice versa) on the probability that a poor household at time t becomes non-poor at time t+1. Specifically, using a sample of workers in poor households in time t, we estimate a probit equation of the form:

$$Prob(OUTPOV_{it} = 1) = \alpha_o + a_1 BELOWTOABOVEMW_{it} + a_2 ABOVETOBELOWMW_{it} + \Delta X'_{it}\beta + \sum_{t=1}^{T} \gamma_t YR_t + \mu_{it}, \quad (4)$$

In equation 4, $OUTPOV_{it}$ equals one if the household of worker i is poor in time t but is not poor in time t+1, and zero if the family of worker i is poor at time t and stays poor in time t+1. The

independent variables include a dummy variable (BELOWTOABOVEMW) that is one if worker i transitions from earning below the minimum wage in time t to earning at or above the minimum wage in time t+1, and another dummy variable (ABOVE TOBELOWMW) that is one if worker i transitions from earning at or above the minimum wage in time t to earning below the minimum wage in time t+1. The coefficient a_1 measures the impact on poverty of a worker moving from a below minimum wage job to an above minimum wage job, while a_2 measures the impact on poverty of a worker moving from an above minimum wage job to a below minimum wage job. We expect the sign of a_1 to be positive, and the sign of a_2 to be negative. Other variables in the equation include year fixed effects and a vector of variables, $\Delta X'_{it}$, that measure changes in human capital characteristics (education) for each individual i over time, the change in the number of young children (0-12 an d12-18) in the household, and a dummy variable that is one if a two-parent household with young children at time t becomes a single parent household at time t+1.

The results of the estimation of the coefficients a_1 and a_2 from equation (2) and (3) are presented in table 14. We estimate two sets of equations: one that examines the impact on poverty and the other that estimates the impact on extreme poverty. These show that moving from a below minimum wage job to an above minimum wage job significantly increases the probability that a worker's family will move out of poverty (by 16 to 29 percentage points, depending on whether we are comparing wage to the individual minimum wage or the *minimum minimorum* wage) and out of extreme poverty (by between 22 to 29 percentage points). On the other hand, moving from an above minimum wage job to a below minimum wage job significantly decreases the probability that a worker's family will move out of poverty or out of extreme poverty.

In summary, our results suggest that earning at or above the minimum wage is associated with a reduction in poverty, and that if a worker's wage increases from below to at or above the minimum wage then his/her family is significantly more likely to escape poverty. On the other hand, if a worker's pay falls from above to below the minimum wage, his/her family is significantly less likely to leave poverty. The policy implications of these results are limited because we do not take into account the possibility that a worker might lose their job if enforcement of minimum wages increases. That is, we cannot conclude from these results that increased enforcement of minimum wages will reduce poverty.

IX. CONCLUSIONS

Legal minimum wages in Costa Rica apply to all private sector employees (*asalariados del sector privado*). However, about 20% of workers are self-employed workers, 9% are owners (*patronos*) and 2% are unpaid family workers, sectors where legal minimum wages clearly cannot be enforced. These workers constitute an uncovered sector. In addition, 14% of workers are found in the public sector, where private sector minimum wages do not apply because wages are set within a different negotiating structure. This implies that minimum wages will potentially affect, at most, a little more than half of Costa Rican workers.

The structure of legal minimum wages in Costa Rica is complex, with separate minimum wages set for workers with different skill levels, education levels and occupations. In this paper, we compare the actual wages of workers with the minimum wage that applies to each individual worker in order to estimate the proportion or workers who earn below, at and above the legal minimum wage.

We find that, over the 2001-2007 period for which we have data, 30% of all workers in Costa Rica earn less than the minimum wage that applies to their skill level, education and occupation, and 19.5% of workers earn less than the lowest minimum wage (the *minimum minimorum*). The proportion of self-employed workers (in the uncovered sector) who earn less than the minimum wage (34%) is higher than in the sector covered by minimum wage legislation, and within the covered sector the proportion of workers who earn less than the minimum wage is largest in micro firms (2-5 employees) and lowest in large firms (20+ employees). Specifically, over 44% of workers in micro firms earn less than the minimum wage, while 21% of workers in large firms earn less than the minimum wage. Our evidence clearly indicates that a substantial proportion of Costa Rican workers earn less than the legal minimum wage, even in large firms and in the sectors legally covered by minimum wages.

As part of our research, we constructed a panel data set that allows us to follow the same workers for up to four consecutive years. This panel data set allows us to study whether workers who earn less than the minimum wage in a given year constitute a "permanent" low wage work force, or whether these sub-minimum wage workers are able to escape sub-minimum wage employment over time. We find substantial mobility of workers around the minimum wage. For example, after one year, one-half of those who earn below the minimum wage are able to escape sub-minimum wage employment, and after three years ¾ of those who initially earned less than the minimum wage escape sub-minimum wage employment. Still, there are workers who continue to earn below the minimum wage for extended periods of time. Workers who remain below the minimum wage for at least four years, the "permanent" sub-minimum wage population, constitute about 6% of all workers in Costa Rica. There is also substantial movement of workers from above to below the legal minimum wage. Even as some workers see their wages rise above the minimum wage, about the same number of workers who initially earned above the minimum wage see their wages fall below the minimum wage, so that the total number of minimum wage workers remains about the same at any given time.

We examine the characteristics of workers who earn less than the minimum wage in any given year, the characteristics of workers who remain below the minimum wage for more than one year, and the characteristics of workers who earn at or above the minimum wage in one year but fall below the minimum wage in the next year. The characteristics of these three groups of vulnerable workers are similar. Specifically, these vulnerable workers are more likely to be self-employed workers, workers in micro or small firms, workers whose employers do not pay for Social Security insurance, workers who do not belong to a union or solidarity organization, domestic servants, and workers employed in agriculture. Further, vulnerable workers are more likely to be workers living in rural areas and outside of the Central Valley, to be less-educated, women, the youngest workers (especially teenagers) and the oldest workers (60 years or older). Vulnerable workers are also less likely to be household heads, more likely to live in single parent households and more likely to live in households with many young children.

In order to understand better which workers are able to escape sub-minimum wage employment, we compared the characteristics of these workers to the characteristics of workers who remained below the minimum wage for extended periods. Workers who are more likely to escape sub-minimum employment are also more likely to be paid employees (*asalariados*) as opposed to self-employed, to work in large firms (20 or more employees) and to be workers whose employers pay Social Security insurance. These results suggest that workers in formal sector jobs are more likely to be able to escape sub-minimum wage employment than workers in the informal sector. In addition, workers in urban areas, workers with more education, and men (compared to women) are

significantly more likely to escape sub-minimum employment. Age also seems to play a role: younger workers (up to 49 years old) who initially earn below the minimum wage are more likely than older workers older workers to escape sub-minimum wage employment. Household heads and spouses are more likely to escape sub-minimum wage employment compared to other family members.

We also found that the proportion of workers earning below the minimum wage increased in 2005 and 2006, coincident with a substantial decline in resources devoted to inspection of firms by the Ministry of Labor. Inspections are the main formal mechanism by which the Ministry of Labor enforces minimum wage and other labor protection legislations. This suggest that enforcement of minimum wage legislation by the Ministry of Labor matters; the proportion of workers earning less than the minimum wage increases as the number of inspections of firms by the Ministry of Labor decreases.

The results regarding the characteristics of workers earning less than the minimum wage suggest that if the Ministry of Labor wants to reduce the number of workers earning less than the minimum wage, they should focus enforcement efforts on firms where workers who are vulnerable to earning or falling below the minimum wage are employed. These are firms where workers are not represented by a union or solidarity organization, whose employers do not pay for Social Security insurance, in agriculture, and in firms with a disproportionate number of women and very young workers, because these workers are more likely to be earning below the legal minimum wage.

Cunningham (2007) suggests several broader mechanisms to improve enforcement of minimum wages in Latin America. "First, set a high penalty and enforce it. This will raise the expected cost of noncompliance, and risk-averse firm owners will increase their compliance rates" (p.69). Second, fewer and simpler minimum wages are more easily enforced. A complex minimum wage system makes it difficult for workers, employers and Ministry of Labor enforcers to know which specific minimum wage applies to which specific worker. "Although multiple minimum wages are desirable to tailor "fair" wages to a particular geographic area, skill level, or productivity level, they are successful only if an equally complex system of oversight accompanies them" (Cunningham, 2007, p. 68). Such a complex system of oversight is expensive and resource-intensive, and therefore is often not provided or is applied only to a small number of large firms in urban areas. A simple minimum wage system, where it is clear and well-known precisely what the value of the minimum wage is for every worker, is the easiest and least expensive to enforce.

Cunningham (2007) also suggests the encouragement of mechanisms by which workers and firms can "self-enforce" minimum wages. Our results suggest that one such mechanism by which minimum wages are self-enforced in Costa Rica is through institutions that represent workers in the workplace, such as unions or solidarity associations. Again, self-enforcement by workers and employers will be easier if the structure of minimum wages is simpler and if the value of the minimum wage that applies to an individual worker is clear to both the worker and employer.

We also examined the relationship between earning below the minimum wage and poverty. Our results suggest that earning at or above the minimum wage is associated with a reduction in poverty, and that if a worker's wage increases from below to at or above the minimum wage then his/her family is significantly more likely to escape poverty. However, previous research of the impact of minimum wages and employment in Costa Rica suggest some caution regarding the desireability of increasing enforcement of minimum wage legislation. Specifically, we have found

that increases in legal minimum wages lead private sector employers to reduce employment in the covered formal sector and leads to increases in uncovered self-employment. It is likely that increased enforcement of minimum wage legislation might also have similar negative effects on formal sector employment. On the other hand, minimum wages may be preferable to direct cash transfers as a means of reducing poverty precisely because they only benefit those workers who maintain their jobs. This is because one argument against direct transfers to the poor is that such transfers may provide a disincentive to work, whereas a higher minimum wage helps the poor only if a family member is employed and therefore provides an incentive to be employed.

Given the potential negative employment effects of increasing enforcement, we suggest that higher minimum wages will have a more positive impact on reducing poverty if there are also programs in place to help those workers from poor families who lose their jobs in the formal sector because of higher minimum wages. Such a program might include an unemployment insurance scheme or employment generation programs such as those financed by the Costa Rica *Fondo de Desarrollo Social y Asignaciones Familiares* (FODESAF).

Our results also suggest that many people escape minimum wage employment not because of enfocement efforts of the Ministry of Labor, but because they have the capacity to earn higher wages. This suggests that more effective policies for reducing the number of sub-minimum wage workers would focus on improving the human capital and other income-earning assets of workers vulnerable to sub-minimum employment. These policies would include improving access to education and training, especially for those workers vulnerable to sub-minimum wage employment. Vulnerable workers include women, the youngest workers (especially teenagers), workers in agriculture and rural areas, workers in micro and small firms, workers in firms where employers do not pay for Social Security insurance, and workers from single-parent households. These characteristics suggest that special attention should be paid to providing access to education and training for young women, especially young single mothers. These results also suggest that programs that promote improved productivity in micro and small firms and in the agricultural sector could be effective in reducing the number of workers who earn less than the minimum wage.

We also find that a worker with formal sector employment is less likely to earn below the minimum wage and is more likely to escape sub-minimum wage employment. This suggests that policies that improve access to formal sector employment for those vulnerable to falling below the minimum wage would help to reduce the proportion of sub-minimum wage workers. Again, vulnerable workers include the young (especially teenagers), women and workers from single parent households, which suggests that policies to facilitate formal sector employment for young women, especially single mothers, might be particularly effective. Such programs might include subsidies for child care during working hours and training directed specifically towards this vulnerable group. Finally, sub-minimum wage workers are more likely to live in rural areas outside of the Central Valley. This suggests that policies to improve human capital and access to formal sector jobs in rural areas, and areas outside of the Central Valley, would be effective in reducing the sub-minimum wage population. These policies could include improving physical, economic and social infrastructure in rural areas, especially those outside of the Central Valley.

BIBLIOGRAPHY

Alaniz, Enrique, T. H. Gindling and Katherine Terrell (2010), "El Impacto del los Salarios Mínimos en los Salarios, el Empleo y la Pobreza en Nicaragua," FUSADES (May).

Alvarado, Yadira. 2005. *Salarios Mínimos y renglones ocupacionales: recorrido histórico 1 octubre 1968 – 1 julio 2005*. San José, Costa Rica: Ministerio de Trabajo y Seguridad Social.

Arango, Carlos and Angelica Pachon (2003), "Distributive Effects of Minimum Wages on Household Incomes: Colombia 1997-2002," Banco de la Republica, Bogota, Colombia.

Belser, Patrick. 2009. *Salario mínimo: Indicadores estadísticos*. Ponencia presentada al TALLER TRIPARTITO SOBRE LA FIJACIÓN DE SALARIOS MÍNIMOS. San José, Costa Rica: Proyecto de Promoción del Diálogo Social de la Organización Internacional del Trabajo.

Chacón, Rubén con el apoyo de Leda Andallah y Diana Fuster. 2003. *Leyes laborales en Costa Rica. Obstáculos legales, políticos y prácticos para su cumplimiento*. San José, Costa Rica: Asociación de Servicios de Promoción Laboral (ASEPROLA).

Cunningham, Wendy (2007), *Minimum Wages and Social Policy: Lessons from Developing Countries*, TheWorld Bank, Washington.

Gindling, T.H. and Katherine Terrell (2009) "Minimum Wages and Employment in Various Sectors in Honduras," *Labour Economics*, Vol. 16, No. 3 (June), pp. 291-303.

_____ (2007) "The Effects of Multiple Minimum Wages throughout the Labor Market: the Case of Costa Rica" *Labour Economics*, Vol. 14: 485-511.

_____ (2005), "Legal Minimum Wages and the Wages of Formal and Informal Sector Workers in Costa Rica," *World Development*, Vol. 33, No. 11 (November): 1905-1921.

_____ (2004) "The Effects of Multiple Minimum Wages throughout the Labor Market," IZA Discussion Paper 1159 (May).

_____ (1995), "The Nature of Minimum Wages and Their Effectiveness as a Wage Floor in Costa Rica," *World Development*, Vol. 23, No. 8 (August), 1439-1458.

Irigaray, Erick. 2009. *Encuesta de Hogares de Propósitos Múltiples: enlace 2001 – 2007*. Instituto Nacional de Estadística y Censos. Presentación al taller interno del proyecto regional "***El Impacto del Salario Mínimo en Los Mercados Laborales de Centroamérica: Un Análisis de Costa Rica, El Salvador y Nicaragua***". San José, Costa Rica.

La Nación: *Mi aspiración es que todos paguen el salario mínimo, entrevista a la Ministra de Trabajo designada, señora Sandra Piszk*. Miércoles 28 de abril de 2010. San José, Costa Rica.

Marinakis, Andrés. 2009. *Lecciones de la aplicación del salario mínimo en América Latina*. Ponencia presentada al TALLER TRIPARTITO SOBRE LA FIJACIÓN DE SALARIOS MÍNIMOS. San José, Costa Rica: Proyecto de Promoción del Diálogo Social de la Organización Internacional del Trabajo.

Ministerio de Trabajo y Seguridad Social (MTSS). 2009. *Breve reseña sobre la evolución de la Legislación Salarial y del Consejo Nacional de Salarios*. San José, Costa Rica: Ministerio de Trabajo y Seguridad Social.

Neumark, D. and W.L. Wascher (2007), "Minimum Wages and Employment," *Foundations and Trends in Microeconomics*, Vol. 3, No. 1-2, 1-182, 2007.

Oliva, Jose Andrés, Álvaro Trigüeros and T. H. Gindling. 2010. "The Impact of Minimum Wages on Wages, Employment and Poverty in El Salvador," FUSADES.

Programa Estado de la Nación (PEN). 2009. *Decimoquinto Informe Estado de la Nación en Desarrollo Humano Sostenible*. San José, Costa Rica: Programa Estado de la Nación.

Trejos, Juan Diego (2009), "Los salarios mínimos en Costa Rica: Información básica y evolución reciente," Report prepared for the International Labour Office.

Vargas-Fernandez, Flora Maria, Alba Rosa Guitierrez-Rodriguez, Grettel Largaespada-Robles and Franklin Benavides-Flores (2009), "Inspección de trabajo e establecimientos: Cobertura inspectiva, Infraccionalidad laboral y cumplimiento patronal en sede administrativa (Con comparaciones anuales entre el 2007 y otros periodos)," Unidad de Investigacion y Calidad de la Gestión, Dirección Nacional de Inspección de Trabajo, San Jose, August.

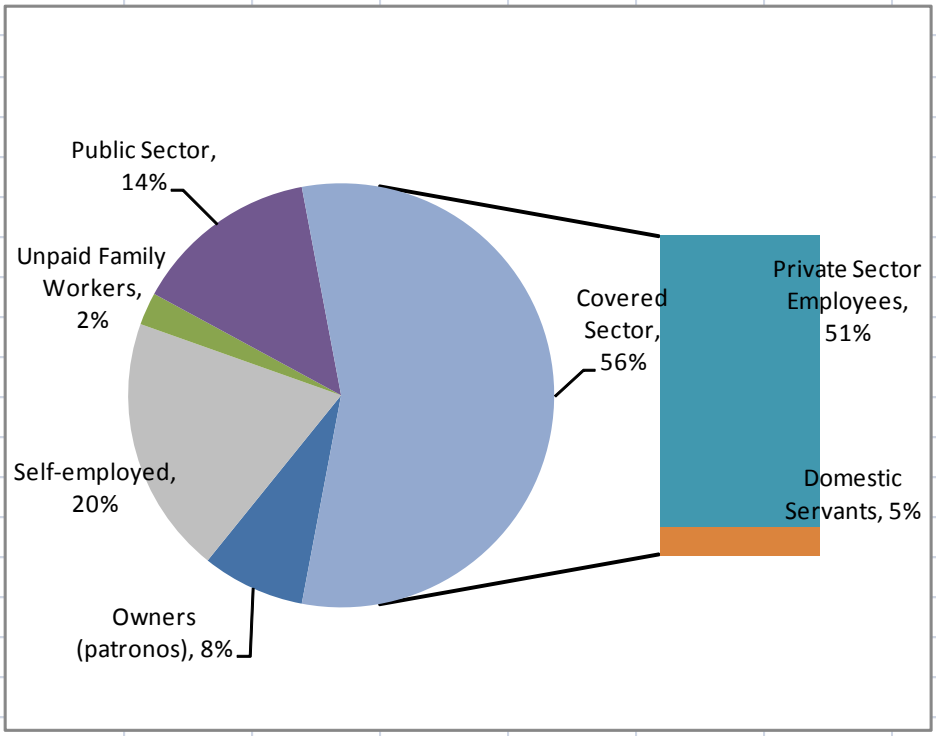
Weil, D. (2005), "Public Enforcement/Private Monitoring: Evaluating a New Approach to Regulating the Minimum Wage," *Industrial and Labor Relations Review*, Vol. 58, 238-257.

Figures and Tables

Figure 1

Costa Rica: Structure of the Employed Population by Occupational Category

(Average 2001-2007))

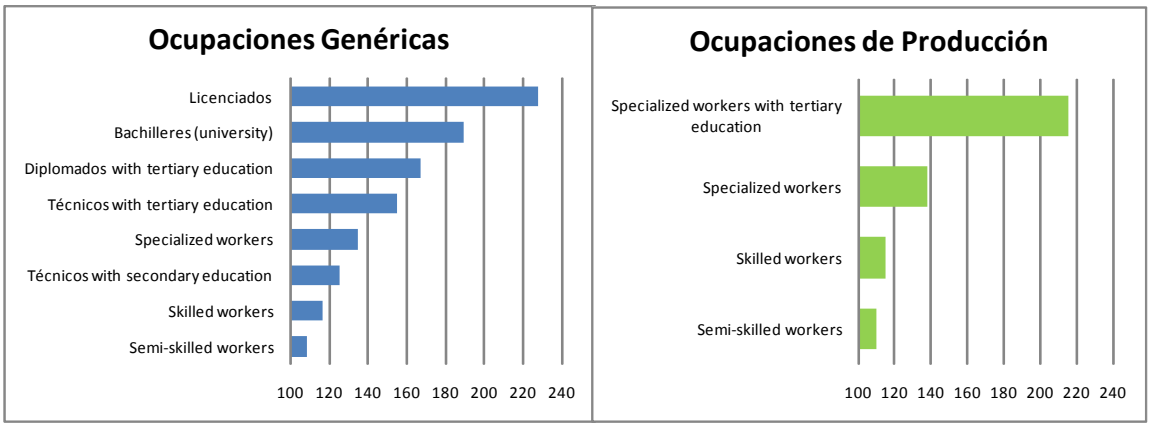


Source: Household Surveys for Muliple Purposes

Figure 2

Costa Rica: Relative scale of Minimum Wages by Cetegory

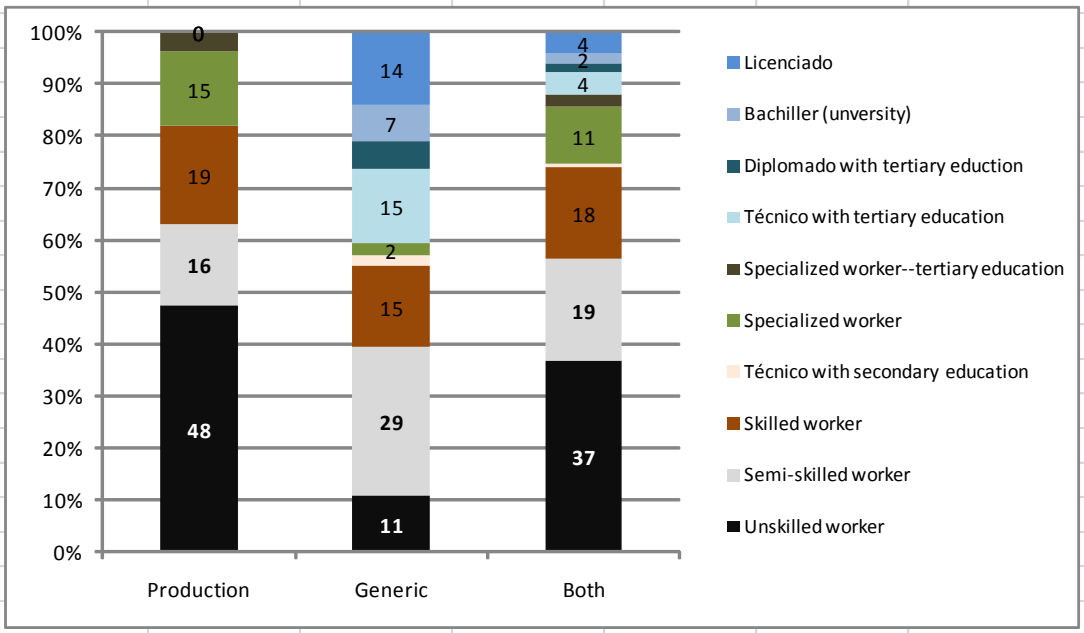
(Minimum Wage of unskilled worker = 100)



Source: Ministry of Labour and the minimum wage decrees published in La Gaceta

Figure 3

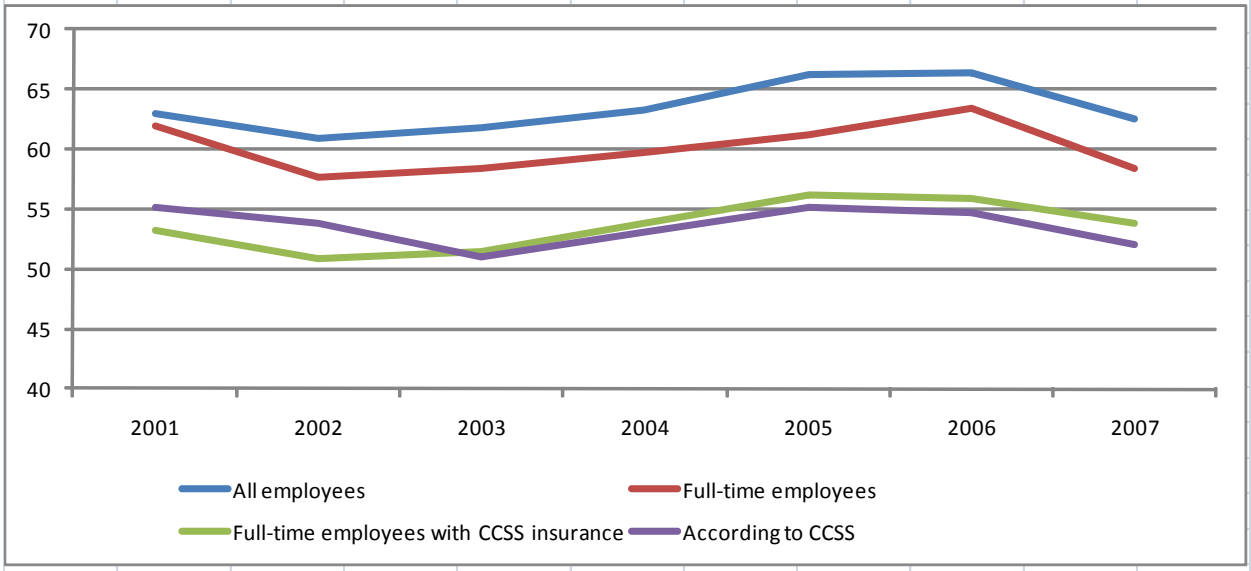
Costa Rica: Structure of employment in the private covered sector, according to minimum wage categories (2001 to 2007 average)



Source: Household Surveys for Multiple Purposes

Figure 4

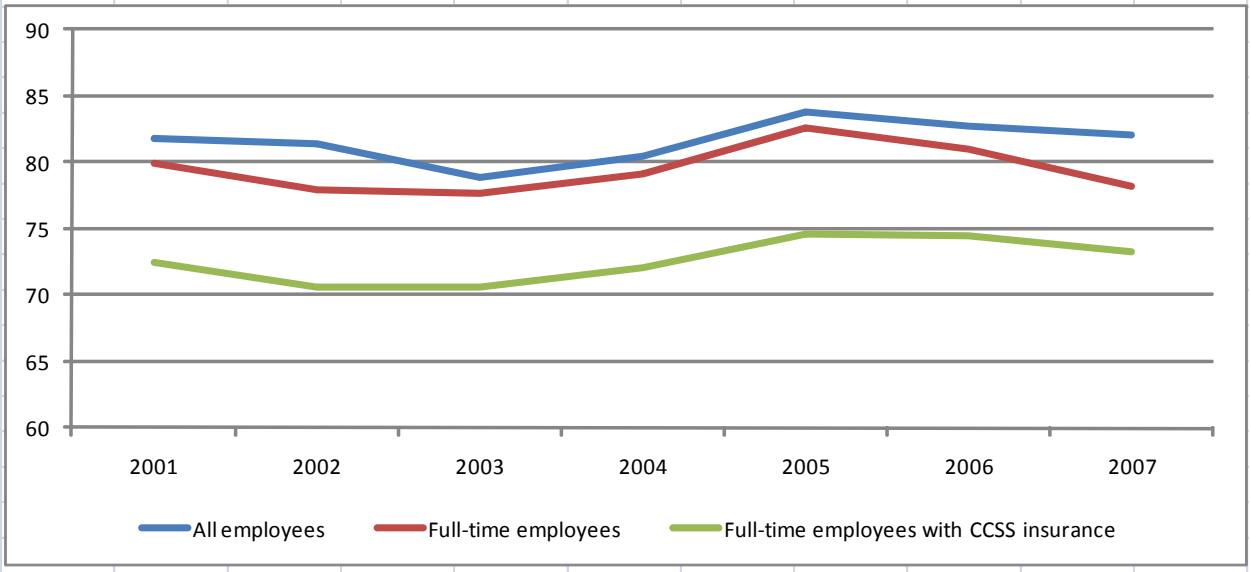
Costa Rica: Minimum wage for unskilled worker as a percent of the mean salary of private sector employees, acording to data from the Caja Costarricence de Seguridad Social (CCSS) and the Household Surveys for Multiple Purposes



Source: CCSS and Household Surveys for Multiple Purposes

Figure 5

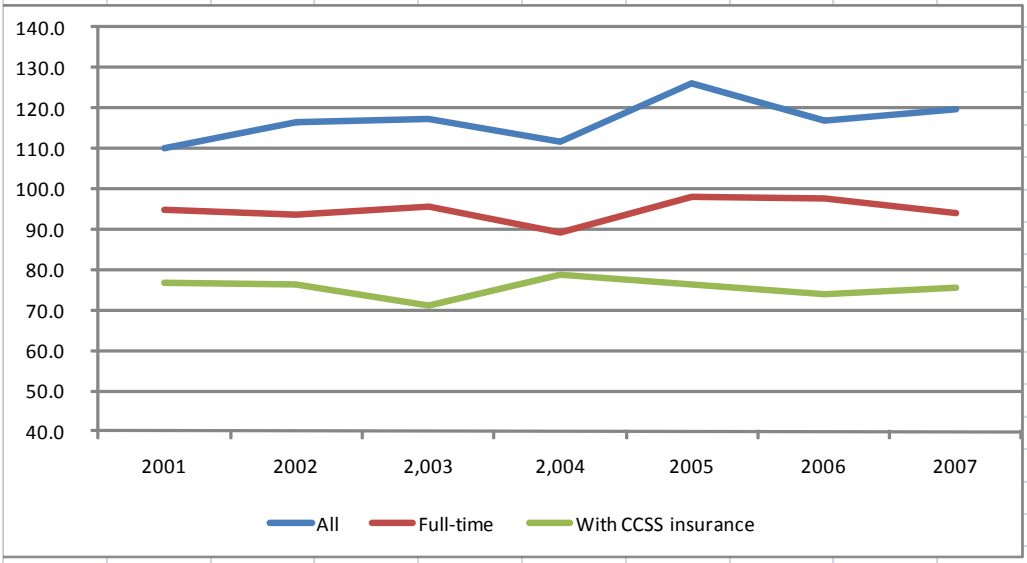
Costa Rica: Minimum wage for unskilled worker as a percent of the median salary of private sector employees, acording to data from the Caja Costarricence de Seguridad Social (CCSS) and the Household Surveys for Multiple Purposes



Source: CCSS and Household Surveys for Multiple Purposes

Figure 6

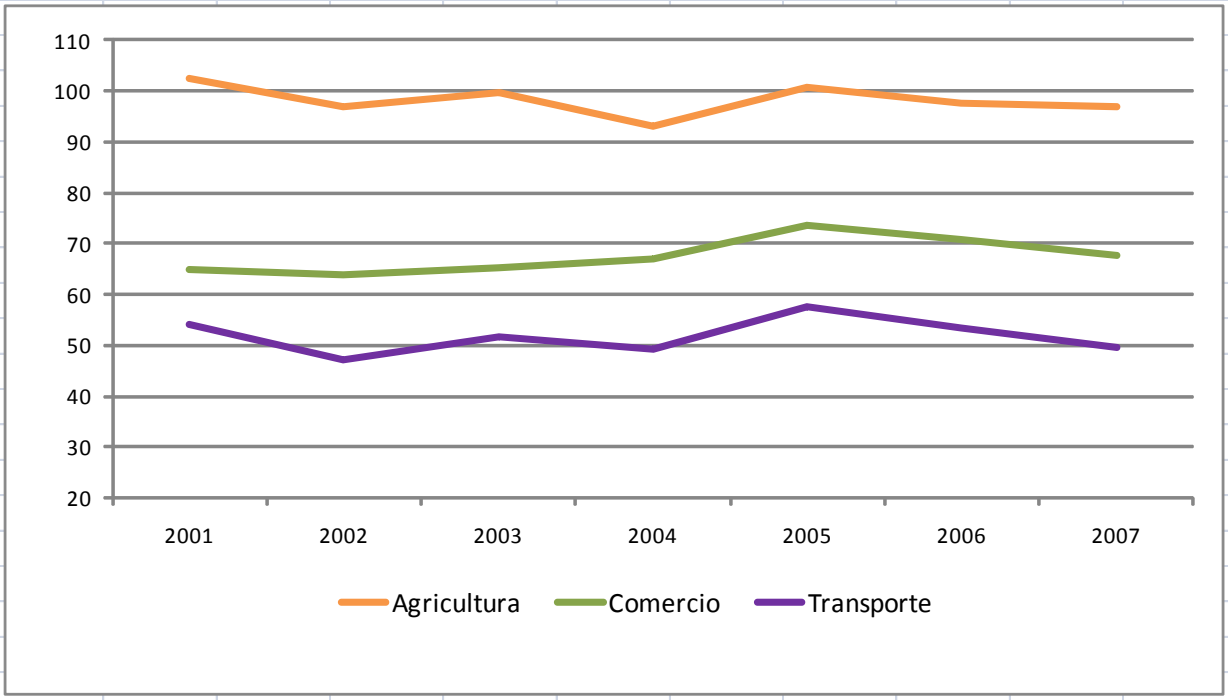
Costa Rica: Minimum wage of domestic servants as a percent of the mean market wage of domestic servants. 2001 - 2007



Source: Household Surveys for Multiple Purposes and Ministry of Labor (minimum wage decrees)

Figure 7

Costa Rica: Minimum wage of an unskilled production worker as a pecent of the mean market wage in three principle industries, 2001 - 2007 0f(Full-time employees in the private sector)

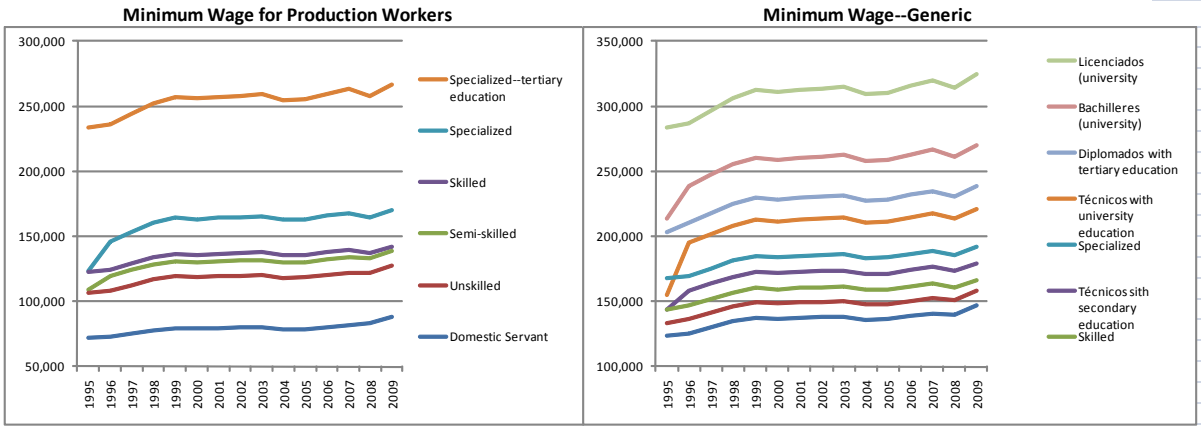


Source: Household Surveys for Multiple Purposes and Ministry of Labor (minimum wage decrees)

Figure 8

Costa Rica: Real minimum wage, yearly average, of an unskilled and skilled worker. 1995 - 2009

(Monthly wage, July 2006 colons)



Source: Household Surveys for Multiple Purposes and Ministry of Labor (minimum wage decrees)

Figure 9: Graphs of (Log Wage - Log Minimum Wage), All Years, By Sector

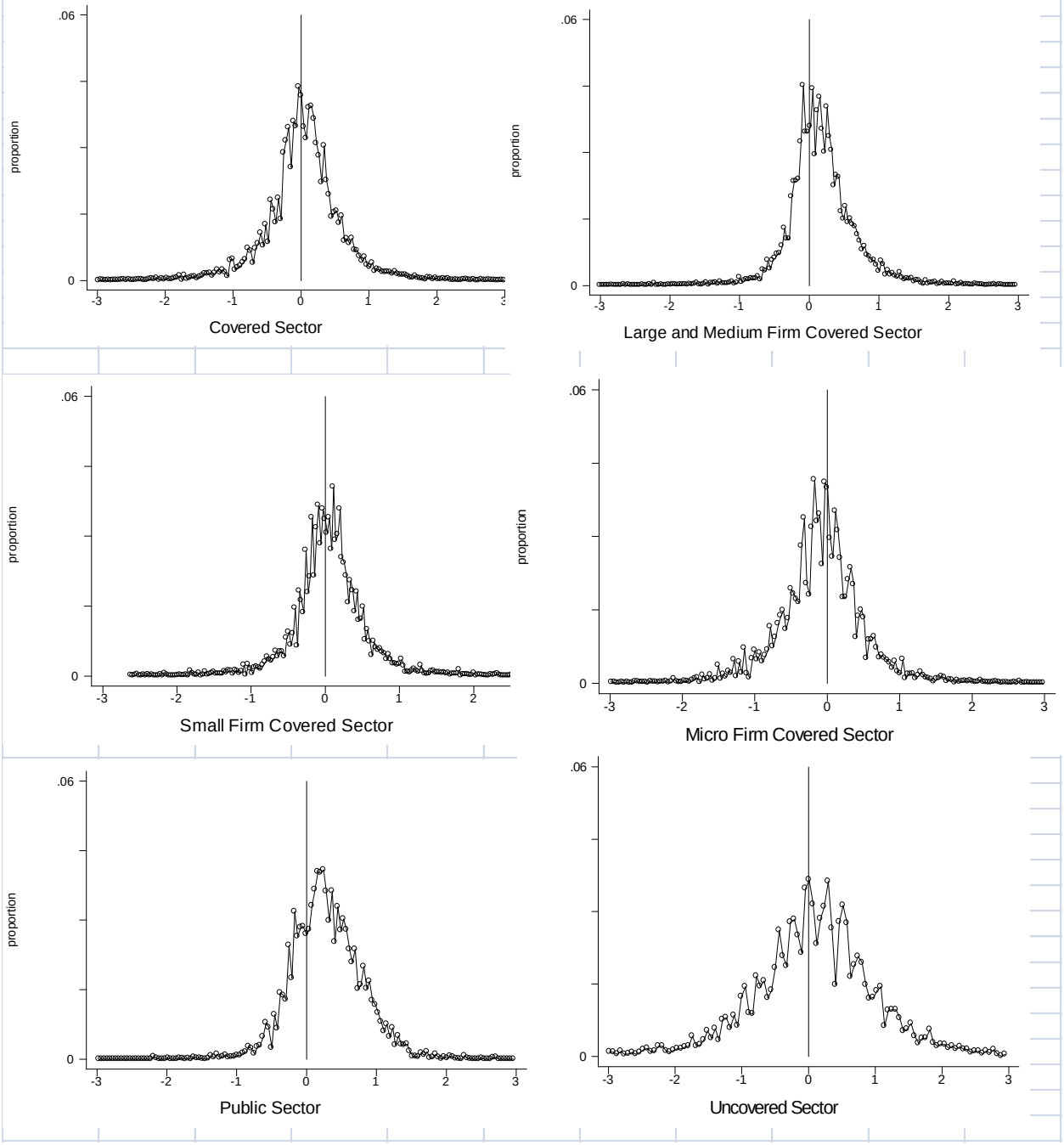


Figure 10: Graphs of (Log Wage - Log Minimum Wage), All Years, By Covered Sector
Workers Insured by CCSS Through Their Employer, Asalariado only

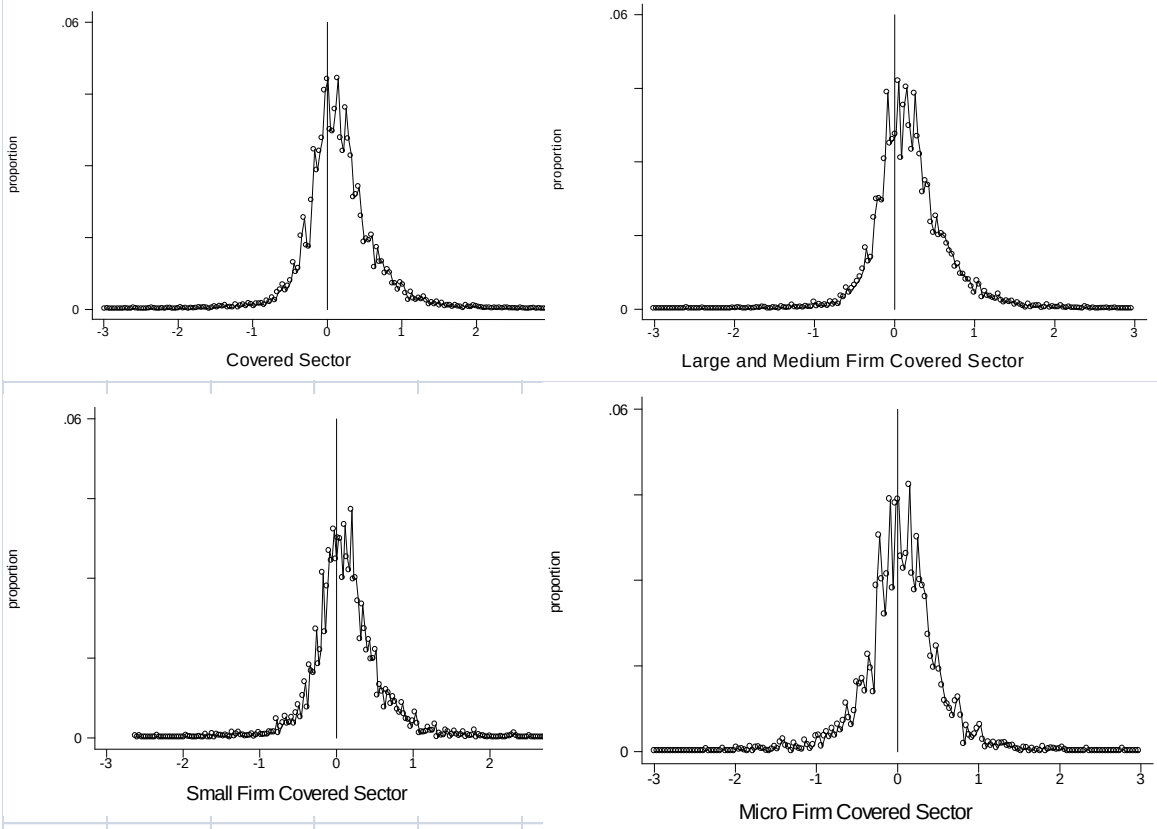


Figure 11: Distribution of the Log of Salary and Log of Minimum Wage, 2007

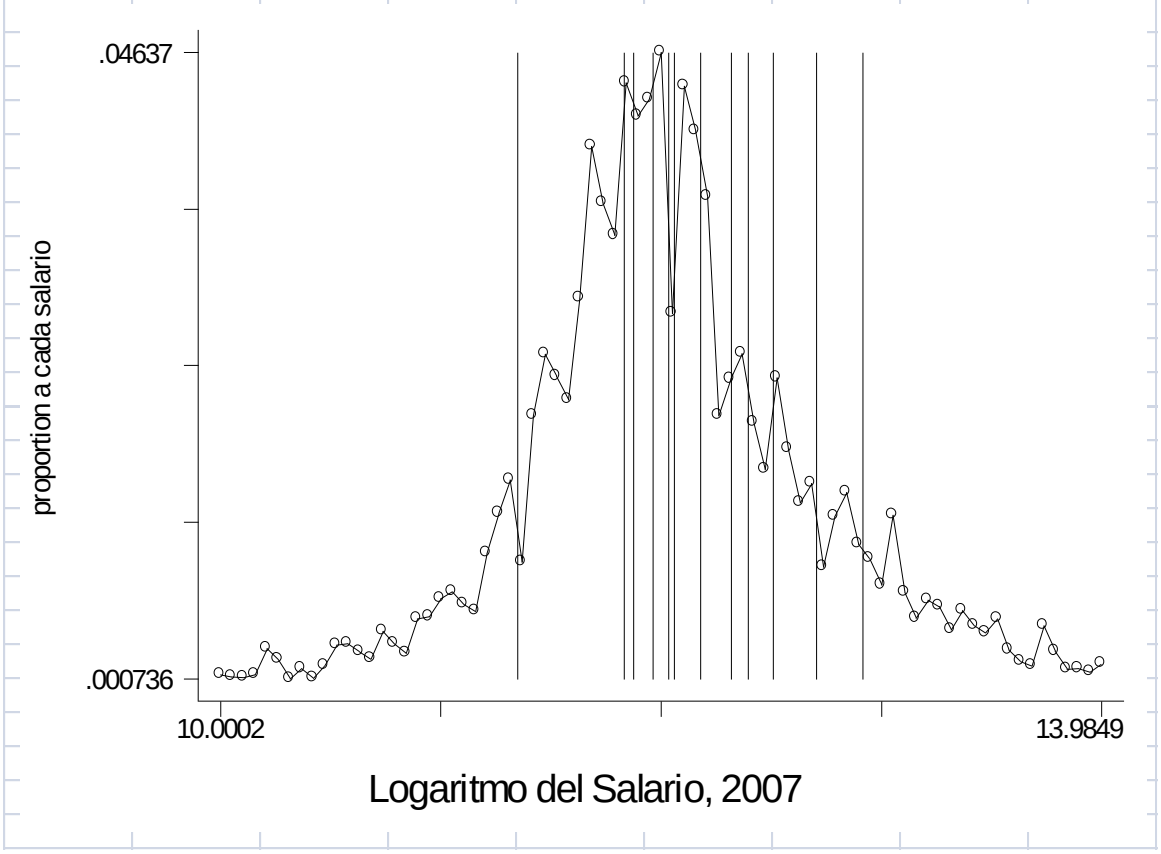


Table 1
Costa Rica: Minimum Wage as a percent of the mean and median wage, for different minimum wage categories (for full-time private sector employees, mean 2001 to 2007)

Minimum Wage Category	Minimum Wage as a % of	
	Mean Wage	Median Wage
Unskilled workers	97.0	100.9
Semi-skilled workers	82.4	90.6
Skilled workers	88.3	95.9
Specialized workers	86.2	99.7
Técnicos with university education	70.0	86.3
Diplomados with tertiary education	85.5	96.0
Bachilleres (university)	63.5	77.8
Licenciados	51.8	62.8

Source: Household Surveys for Multiple Purposes and Ministry of Labor (minimum wage decrees)

Table 2

Costa Rica: Evolution of Macroeconomic Indicators. 1996 - 2009

(Mean annual rates of change)

Indicator	Subperiods			1996/2009
	1996/1999	2000/2007	2008/2009	
Minimum Wage				
Unskilled worker	2.9	0.3	2.4	1.3
Skilled worker	2.7	0.3	0.7	1.0
Covered sector (private sector employees)				
Mean earnings CCSS [1]	4.2	0.6	1.0	1.7
Mean earnings EHPM [2]	2.7	0.5	4.8	1.7
Uncovered sector				
Public sector employees				
Mean earnings CCSS [1]	3.2	0.8	7.0	2.3
Mean earnings EHPM [2]	1.0	0.5	6.9	1.5
Self-employed workers				
Mean earnings EHPM [2]	-0.1	-0.5	5.2	0.4
Gross Domestic Product				
Total	5.7	4.8	0.7	4.5
Per person	3.2	3.1	-0.5	2.6
Per employee	3.5	0.9	0.0	1.5
Inflation rate (yearly average)	13.1	11.0	10.6	11.5
Labor market				
Total employees	2.2	3.9	0.8	2.9
Unemployment rate (average)	5.7	6.0	6.4	5.9

1/ Of the employees insured in the CCSS, yearly average.

2/ Of workers with reported earnings, July of each year.

Sopurce: Ministry of Labor, Central Bank of Costa Rica, and INEC.

TABLE 3: Violations of minimum wage laws found during inspections

	Inspections	% of Inspections that found violations of minimum wage laws				
		All firms	Commerce	Services	Manufacturing	Agriculture
2000	13370	39.0%	35.6%	42.0%	34.4%	50.0%
2001	13903					
2002	10534					
2003	12264					
2004	13317					
2005	11242					
2006	9968					
2007	8669	39.4%	12.4%	27.6%	35.7%	57.1%

Source: Vargas Fernandez, et. al. (2009)

TABLE 4: Percent earning below 90% and within 10% (between 90% and 110%) of the legal minimum wage, by year, 2001-2007

	COMPARING SALARY TO INDIVIDUAL MINIMUM WAGE				COMPARING SALARY TO *MINIMUM MINIMORUM* WAGE**			
	All Workers		Private Covered Sector		All Workers		Private Covered Sector	
	Below MW	At MW	Below MW	At MW	Below MW	At MW	Below MW	At MW
2001	28.41	17.10	29.17	20.91	18.74	11.89	18.08	15.78
2002	28.13	15.16	28.52	18.72	20.21	9.21	19.76	11.97
2003	27.42	16.41	27.57	20.68	17.64	12.15	16.99	15.89
2004	28.56	18.10	28.21	22.14	18.46	13.63	17.10	17.22
2005	31.80	16.69	33.37	19.90	20.20	11.60	20.34	15.38
2006	32.81	16.71	34.10	20.80	22.53	11.97	22.63	15.27
2007	28.96	17.39	29.95	20.91	18.17	10.89	18.57	14.21

Note: Encuesta de Hogares de Propositos Multiples, weighted by population weights,
comparing earnings in primary employment (for those with non-zero earnings) to the minimum wage.
* Excluding domestic servants.
**The *minimum minimorum* wage is the lowest minimum wage (except for the wage
for domestic servants).

TABLE 5: Percent earning below 90% and within 10% (between 90% and 110%) of the legal minimum wage, average over 2001-2007

	COMPARING SALARY TO INDIVIDUAL MINIMUM WAGE				COMPARING SALARY TO *MINIMUM MINIMORUM* WA			
	PART-TIME PLUS FULL-TIME		FULL-TIME ONLY		PART-TIME PLUS FULL-TIME		FULL-TIME ONLY	
	Below MW	At MW	Below MW	At MW	Below MW	At MW	Below MW	At MW
PANEL A: ALL WORKERS								
ALL	29.65	16.81	29.34	18.59	19.46	11.63	17.25	12.22
SELF-EMPLOYED	34.06	10.08	35.86	11.48	28.28	8.76	28.20	9.21
PUBLIC	18.07	14.37	18.67	14.83	3.66	4.17	3.66	4.44
DOMESTIC SERVANTS	36.03	14.95	48.83	18.64	na	na	na	na
SALARIED*	29.88	21.11	28.81	22.22	19.14	15.11	17.14	15.51
LARGE/MEDIUM (20+)	21.06	21.40	21.26	22.09	10.28	13.12	10.15	13.49
SMALL (6-19)	30.43	21.88	30.50	23.15	17.70	15.39	16.68	16.26
MICRO (2-5)	44.37	20.01	44.36	21.78	35.24	18.32	33.37	19.49
URBAN	24.69	16.02	25.05	17.79	13.45	9.68	12.23	10.32
RURAL	37.69	18.08	36.90	20.00	29.30	14.82	26.21	15.59
PANEL B: FOR ONLY THOSE WORKERS WHO ARE INSURED BY SOCIAL SECURITY THROUGH THEIR EMPLOYERS (ASALARIADO ONLY)								
ALL	20.00	20.07	20.34	20.63	7.60	10.92	7.64	11.29
SELF-EMPLOYED	na	na	na	na	na	na	na	na
PUBLIC	17.51	14.43	18.13	14.81	3.28	4.02	3.31	4.31
DOMESTIC SERVANTS	18.21	21.15	19.84	23.41	na	na	na	na
SALARIED*	21.06	22.32	21.20	22.82	9.43	13.70	9.32	13.99
LARGE/MEDIUM (20+)	18.81	21.76	19.19	22.28	8.08	12.72	8.22	13.01
SMALL (6-19)	23.43	23.11	24.03	23.76	9.72	13.69	9.76	18.34
MICRO (2-5)	30.68	22.74	30.56	23.74	18.94	17.63	17.73	18.34
URBAN	18.17	18.42	18.60	19.00	5.38	8.56	5.41	8.92
RURAL	23.94	23.62	24.04	24.11	12.58	16.01	12.41	16.34

Note: Encuesta de Hogares de Propositos Multiples, weighted by population weights,
comparing earnings in primary employment (for those with non-zero earnings) to the minimum wage.
* Excluding domestic servants.
**The *minimum minimorum* wage is the lowest minimum wage (except for the wage for domestic servants).
Insured by CCSS if the employer pays for CCSS insurance (including public sector) or if the worker is covered by a "convenio".

TABLE 6: Percent earning below 90% and within 10% (between 90% and 110%) of the legal minimum wage, in each wage decile, 2007			
	COMPARING SALARY TO INDIVIDUAL MINIMUM WAGE		
	% of workers in each decile earning less than the MW		
	Below MW	At MW	Above MW
DECILE IN THE SALARY DISTRIBUTION			
1	100.00	0.00	0.00
2	88.78	5.40	5.82
3	60.55	33.09	6.36
4	23.50	52.08	24.41
5	11.02	35.48	53.50
6	11.91	22.25	65.83
7	8.22	4.89	86.89
8	10.05	9.76	80.18
9	0.84	8.21	90.94
10	0.00	0.00	100.00
Note: Encuesta de Hogares de Propositos Multiples, weighted by population weights, comparing earnings in primary employment (for those with non-zero earnings) to the minimum wage.			

TABLE 7: Variables Explaining the Probability that a Worker is Earning Below the Minimum Wage (MW)

Variable	Below Individual MW						Below *Minimum Minimorum* MW					
	All Workers			Covered Sector Only			All Workers			Covered Sector Only		
	dPr/dX		(se)	dPr/dX		(se)	dPr/dX		(se)	dPr/dX		(se)
JOB CHARACTERISTICS												
Self-employed = 1	0.121	***	(0.0054)	na			0.131	***	(0.0049)	na		
Micro Firm (2-5) = 1	0.174	***	(0.0055)	0.145	***	(0.0057)	0.167	***	(0.0054)	0.131	***	(0.005)
Small Firm (6-19) = 1	0.086	***	(0.0057)	0.065	***	(0.0063)	0.063	***	(0.0053)	0.049	***	(0.0054)
Insured by CCSS = 1	-0.158	***	(0.004)	-0.199	***	(0.0053)	-0.136	***	(0.0034)	-0.177	***	(0.005)
Part-time = 1	-0.166	***	(0.0033)	-0.168	***	(0.0044)	-0.084	***	(0.0024)	-0.068	***	(0.0036)
Payment in Kind = 1	-0.045	***	(0.005)	-0.029	***	(0.0057)	-0.017	***	(0.0043)	-0.012	**	(0.0048)
Belongs to union = 1	-0.055	***	(0.0083)	-0.078	***	(0.0145)	-0.050	***	(0.0076)	-0.046	***	(0.0117)
Belongs to solidarity org = 1	-0.098	***	(0.0062)	-0.110	***	(0.0079)	-0.082	***	(0.005)	-0.084	***	(0.0062)
Public = 1	0.034	***	(0.0081)	na			-0.052	***	(0.0061)	na		
Domestic Servant = 1	0.028		(0.0187)	na			na			na		
Agriculture = 1	0.283	***	(0.0194)	0.233	***	(0.0261)	0.344	***	(0.0404)	0.317	***	(0.0519)
Manufacturing = 1	0.192	***	(0.0198)	0.155	***	(0.0261)	0.179	***	(0.038)	0.163	***	(0.0482)
Mining = 1	0.109	***	(0.0413)	0.009		(0.0467)	0.205	***	(0.0579)	0.141	**	(0.0702)
Utilities = 1	0.045	*	(0.0257)	0.146	***	(0.0441)	0.101	***	(0.0442)	0.134	**	(0.067)
Construction = 1	-0.053	***	(0.0162)	-0.084	***	(0.0204)	0.027		(0.0281)	0.033		(0.0384)
Commerce = 1	0.093	***	(0.0186)	0.078	***	(0.0249)	0.136	***	(0.0342)	0.125	***	(0.0447)
Hotels = 1	0.078	***	(0.0199)	0.063	*	(0.0262)	0.099	***	(0.035)	0.092	**	(0.046)
Transportation = 1	0.024		(0.0188)	0.039		(0.026)	0.049		(0.0308)	0.061		(0.043)
Real Estate = 1	0.124	***	(0.0209)	0.116	***	(0.0278)	0.119	***	(0.037)	0.106	**	(0.0481)
Private personal services = 1	0.167	***	(0.0189)	0.181	***	(0.0278)	0.191	***	(0.0368)	0.180	***	(0.0536)
PERSONAL CHARACTERISTICS												
Rural = 1	0.045	***	(0.0034)	0.041	***	(0.0045)	0.038	***	(0.0027)	0.040	***	(0.0038)
Chorotega	0.069	***	(0.0056)	0.068	***	(0.0076)	0.044	***	(0.0047)	0.043	***	(0.0065)
Pacifico Central	0.017	***	(0.0055)	-0.002		(0.0072)	0.017	***	(0.0045)	0.003		(0.0059)
Brunca	0.103	***	(0.0055)	0.123	***	(0.0077)	0.069	***	(0.0047)	0.079	***	(0.0068)
H. Atlantico	0.020	***	(0.0053)	0.009		(0.0069)	0.023	***	(0.0042)	0.013	**	(0.0056)
H. Norte	0.013		(0.0063)	0.019		(0.0085)	-0.007		(0.0046)	-0.001		(0.0066)
Female = 1	0.103	***	(0.0046)	0.109	***	(0.006)	0.085	***	(0.0041)	0.089	***	(0.0056)
Years of Education	-0.013	***	(0.0005)	-0.012	***	(0.0007)	-0.019	***	(0.0004)	-0.018	***	(0.0006)
Age 12-19 = 1	0.111	***	(0.008)	0.095	***	(0.0096)	0.096	***	(0.0073)	0.087	***	(0.0088)
Age 20-29 = 1	0.023	***	(0.0051)	0.011	*	(0.0067)	0.001		(0.004)	-0.002		(0.0056)
Age 30-39 = 1	0.007		(0.0047)	0.002		(0.0066)	-0.005		(0.0037)	-0.005		(0.0055)
Age 50-59 = 1	0.024	***	(0.0059)	0.029	***	(0.0091)	0.012	***	(0.0046)	0.009		(0.0076)
Age 60+ = 1	0.148	***	(0.0085)	0.142	***	(0.0143)	0.078	***	(0.0072)	0.076	***	(0.0131)
Immigrant = 1	-0.021	***	(0.005)	-0.037	***	(0.006)	-0.001		(0.004)	-0.019	***	(0.0049)

TABLE 7 (continued)												
Variable	**Below Individual MW**						**Below *Minimum Minimorum* MW**					
	All Workers			Covered Sector Only			All Workers			Covered Sector Only		
	dPr/dX		(se)	dPr/dX		(se)	dPr/dX		(se)	dPr/dX		(se)
FAMILY CHARACTERISTICS												
Spouse = 1	0.015	***	(0.0056)	0.008		(0.0077)	0.018	***	(0.0047)	0.020	***	(0.0071)
Other family member = 1	0.116	***	(0.0046)	0.110	***	(0.0056)	0.083	***	(0.0039)	0.081	***	(0.0048)
Number of children (<=12)	-0.002	*	(0.0014)	-0.002		(0.0018)	-0.001		(0.0011)	0.000		(0.0014)
Number of chldren (13-18)	0.004	**	(0.0019)	0.007	***	(0.0024)	0.006	***	(0.0014)	0.008	***	(0.0019)
Single parent household = 1	0.011	**	(0.0054)	0.010		(0.0066)	0.017	***	(0.0044)	0.009	*	(0.0055)
TIME DUMMY VARIABLES												
2002 = 1	-0.001		(0.006)	-0.002		(0.008)	0.013	***	(0.0049)	0.018	***	(0.007)
2003 = 1	-0.005		(0.006)	-0.009		(0.0078)	-0.004		(0.0047)	-0.002		(0.0065)
2004 = 1	0.015	**	(0.0061)	0.009		(0.0081)	0.016	***	(0.005)	0.017	**	(0.007)
2005 = 1	0.049	***	(0.0061)	0.055	***	(0.0081)	0.032	***	(0.005)	0.045	***	(0.0071)
2006 = 1	0.061	***	(0.0061)	0.067	***	(0.0082)	0.062	***	(0.0054)	0.079	***	(0.0077)
2007 = 1	0.015	***	(0.0058)	0.017	**	(0.0076)	0.013	***	(0.0047)	0.029	***	(0.0067)
Number of Observations	107045			62628			101419			57002		
Log Likelihood	23421			14024			35072			19486		
Notes: Standard errors in parentheses,												
*** p<0.01, ** p<0.05, * p<0.1												
Contributes to CCSS insurance is a dummy variable equal to 1 if the employer pays for CCSS												
insurance, if the worker is covered by a "convenio," or if self-employed workers contribute												
voluntarily to the CCSS.												

TABLE 8: Variables Explaining the Probability that a Worker is Earning At the Minimum Wage (MW)

Variable	At Individual MW						At *Minimum Minimorum* MW					
	All Workers			Covered Sector Only			All Workers			Covered Sector Only		
	dPr/dX		(se)	dPr/dX		(se)	dPr/dX		(se)	dPr/dX		(se)
JOB CHARACTERISTICS												
Self-employed = 1	-0.095	***	-(0.0033)	na			-0.044	***	(0.0031)	na		
Micro Firm (2-5) = 1	-0.007		(0.0037)	-0.004		(0.0048)	0.026	***	(0.0035)	0.037	***	(0.0047)
Small Firm (6-19) = 1	0.004		(0.0038)	0.003		(0.005)	0.009	***	(0.0035)	0.013	***	(0.0049)
Insured by CCSS = 1	0.018	***	(0.0031)	0.032	***	(0.0044)	-0.026	***	(0.0028)	-0.027	***	(0.0044)
Part-time = 1	-0.071	***	(0.003)	-0.097	***	(0.0044)	-0.055	***	(0.0024)	-0.074	***	(0.0041)
Payment in Kind = 1	-0.026	***	(0.0037)	-0.031	***	(0.0049)	-0.025	***	(0.0033)	-0.035	**	(0.0047)
Belongs to union = 1	-0.017	***	(0.0063)	-0.041	***	(0.0122)	-0.045	***	(0.0057)	-0.061	***	(0.0107)
Belongs to solidarity org = 1	-0.026	***	(0.0045)	-0.040	***	(0.0065)	-0.042	***	(0.004)	-0.054	***	(0.006)
Public = 1	-0.009		(0.0059)	na			-0.026	***	(0.0055)	na		
Domestic Servant = 1	-0.012		(0.0124)	na			na			na		
Agriculture = 1	0.050	***	(0.014)	0.061	***	(0.0213)	0.130	***	(0.027)	0.203	***	(0.0448)
Manufacturing = 1	0.043	***	(0.0141)	0.053	***	(0.0213)	0.106	***	(0.026)	0.171	***	(0.044)
Mining = 1	0.094	***	(0.034)	0.131	**	(0.0445)	0.060		(0.038)	0.107	*	(0.0626)
Utilities = 1	0.035	*	(0.0186)	0.032	***	(0.0362)	0.084	***	(0.0317)	0.173	***	(0.065)
Construction = 1	0.050	***	(0.0144)	0.033		(0.0206)	0.074	***	(0.0237)	0.133	***	(0.0428)
Commerce = 1	0.042	***	(0.0134)	0.055		(0.0209)	0.082	***	(0.0229)	0.142	***	(0.0412)
Hotels = 1	0.097	***	(0.0168)	0.121	***	(0.0247)	0.120	***	(0.0284)	0.198	**	(0.0485)
Transportation = 1	0.031	**	(0.0142)	0.019		(0.0213)	0.066		(0.0238)	0.104	***	(0.0426)
Real Estate = 1	0.077	***	(0.0166)	0.087	***	(0.0245)	0.078	***	(0.0257)	0.134	***	(0.0456)
Private personal services = 1	0.031	***	(0.0129)	0.019		(0.0216)	0.061	***	(0.0216)	0.078	*	(0.0416)
PERSONAL CHARACTERISTICS												
Rural = 1	0.013	***	(0.0027)	0.019	***	(0.0039)	0.018	***	(0.0024)	0.025	***	(0.0038)
Chorotega	-0.003		(0.0042)	-0.010		(0.0062)	0.002		(0.0038)	-0.006		(0.006)
Pacifico Central	-0.001	***	(0.0043)	-0.007		(0.0061)	0.006		(0.0038)	0.010		(0.006)
Brunca	-0.015	***	(0.004)	-0.029	***	(0.006)	0.002	***	(0.0037)	0.001		(0.0059)
H. Atlantico	-0.016	***	(0.004)	-0.028	***	(0.0056)	-0.010	***	(0.0034)	-0.020	***	(0.0052)
H. Norte	-0.005		(0.0049)	-0.015	**	(0.007)	-0.014		(0.004)	-0.023	***	(0.0064)
Female = 1	0.018	***	(0.0036)	0.027	***	(0.0052)	0.036	***	(0.0034)	0.057	***	(0.0054)
Years of Education	-0.007	***	(0.0004)	-0.009	***	(0.0006)	-0.013	***	(0.0004)	-0.016	***	(0.0006)
Age 12-19 = 1	0.023	***	(0.0063)	0.027	***	(0.0085)	0.042	***	(0.0061)	0.055	***	(0.0088)
Age 20-29 = 1	0.027	***	(0.0042)	0.029	***	(0.0059)	0.022	***	(0.0038)	0.028	***	(0.0059)
Age 30-39 = 1	0.003		(0.0037)	0.001		(0.0057)	0.006	*	(0.0034)	0.009		(0.0057)
Age 50-59 = 1	-0.003		(0.0047)	0.017	**	(0.008)	0.001		(0.0042)	0.017	**	(0.0081)
Age 60+ = 1	-0.018		(0.0064)	-0.010		(0.0114)	-0.006		(0.0055)	0.015		(0.0119)
Immigrant = 1	0.006		(0.0041)	0.013	**	(0.0055)	-0.002		(0.0035)	-0.002		(0.0052)

TABLE 8 (continued)												
Variable	**Below Individual MW**						**Below *Minimum Minimorum* MW**					
	All Workers			Covered Sector Only			All Workers			Covered Sector Only		
	dPr/dX		(se)	dPr/dX		(se)	dPr/dX		(se)	dPr/dX		(se)
FAMILY CHARACTERISTICS												
Spouse = 1	0.008		(0.0046)	0.003		(0.0068)	0.003		(0.0042)	0.013	*	(0.0071)
Other family member = 1	0.015	***	(0.0035)	0.015	***	(0.0048)	0.034	***	(0.0032)	0.045	***	(0.0047)
Number of children (<=12)	-0.001		(0.0011)	-0.002		(0.0015)	0.000		(0.0009)	0.000		(0.0015)
Number of children (13-18)	0.001		(0.0015)	0.001		(0.0021)	0.000		(0.0013)	-0.001		(0.002)
Single parent household = 1	0.005		(0.0044)	0.001		(0.006)	0.017	***	(0.004)	0.015	**	(0.0059)
TIME DUMMY VARIABLES												
2002 = 1	-0.018	***	(0.0046)	-0.019	***	(0.0067)	-0.027	***	(0.0037)	-0.038	***	(0.0059)
2003 = 1	-0.003		(0.0047)	0.004		(0.0069)	0.007	*	(0.0042)	0.009		(0.0066)
2004 = 1	0.014	***	(0.0049)	0.015	**	(0.0071)	0.025	***	(0.0045)	0.022	**	(0.0069)
2005 = 1	0.000		(0.0046)	-0.002		(0.0067)	0.002		(0.0041)	-0.002		(0.0063)
2006 = 1	-0.002		(0.0046)	0.000		(0.0068)	0.010	*	(0.0042)	0.005		(0.0065)
2007 = 1	-0.001		(0.0045)	-0.004		(0.0065)	-0.010	***	(0.0038)	-0.020	***	(0.0059)
Number of Observations	107045			62628			101419			57002		
Log Likelihood	23421			14024			35072			19486		
Notes: Standard errors in parentheses,												
*** p<0.01, ** p<0.05, * p<0.1												
Contributes to CCSS insurance is a dummy variable equal to 1 if the employer pays for CCSS												
insurance, if the worker is covered by a "convenio," or if self-employed workers contribute												
voluntarily to the CCSS.												

TABLE 9: Characteristics of Workers Earning Below, At and Above the Minimum Wage
(Proportion of workers in each category who have the following characteristics)

Variable	All Workers			Covered Sector Workers Only		
	Below MW	At MW	Above MW	Below MW	At MW	Above MW
JOB CHARACTERISTICS						
Self-employed = 1	0.316	0.165	0.286	na	na	na
Micro Firm (2-5) = 1	0.295	0.231	0.152	0.493	0.321	0.279
Small Firm (6-19) = 1	0.126	0.158	0.115	0.190	0.203	0.185
Medium and Large Firms (20+)	0.253	0.436	0.440	0.317	0.476	0.537
Insured by CCSS = 1	0.477	0.691	0.712	0.496	0.714	0.766
Part-time = 1	0.238	0.147	0.250	0.191	0.119	0.194
Payment in Kind = 1	0.087	0.102	0.099	0.134	0.125	0.147
Belongs to union = 1	0.026	0.038	0.063	0.012	0.018	0.029
Belongs to solidarity org = 1	0.036	0.078	0.115	0.036	0.075	0.131
Public = 1	0.087	0.122	0.180	na	na	na
Domestic Servant = 1	0.062	0.045	0.047	0.106	0.064	0.088
Agriculture = 1	0.235	0.162	0.090	0.241	0.186	0.109
Manufacturing = 1	0.145	0.157	0.132	0.163	0.190	0.189
Mining = 1	0.002	0.003	0.002	0.002	0.003	0.003
Utilities = 1	0.005	0.011	0.017	0.003	0.004	0.004
Construction = 1	0.052	0.076	0.080	0.057	0.076	0.095
Commerce = 1	0.182	0.180	0.193	0.182	0.194	0.199
Hotels = 1	0.056	0.073	0.048	0.073	0.093	0.063
Transportation = 1	0.040	0.050	0.077	0.040	0.044	0.074
Real Estate = 1	0.053	0.066	0.063	0.059	0.076	0.068
Private personal services = 1	0.163	0.164	0.220	0.069	0.061	0.079
Finance = 1	0.007	0.013	0.031	0.007	0.010	0.029
PERSONAL CHARACTERISTICS						
Rural = 1	0.486	0.410	0.316	0.495	0.427	0.331
Region Central	0.583	0.666	0.721	0.599	0.674	0.732
Chorotega	0.088	0.067	0.057	0.080	0.063	0.050
Pacifico Central	0.055	0.052	0.046	0.052	0.052	0.047
Brunca	0.097	0.061	0.051	0.091	0.054	0.041
H. Atlantico	0.110	0.099	0.082	0.113	0.103	0.090
H. Norte	0.066	0.055	0.042	0.065	0.054	0.040
Female = 1	0.384	0.349	0.335	0.374	0.337	0.306
No Education	0.050	0.029	0.018	0.044	0.032	0.020
Primary Education	0.522	0.469	0.353	0.537	0.501	0.387
Secondary Education	0.295	0.348	0.351	0.322	0.364	0.381
Tertiaty Education	0.129	0.149	0.274	0.090	0.098	0.207
Age 12-19 = 1	0.129	0.083	0.039	0.183	0.104	0.059
Age 20-29 = 1	0.280	0.336	0.249	0.352	0.389	0.337
Age 30-39 = 1	0.221	0.243	0.280	0.211	0.235	0.290
Age 40-49 = 1	0.186	0.202	0.261	0.143	0.165	0.204
Age 50-59 = 1	0.109	0.099	0.128	0.072	0.080	0.085
Age 60+ = 1	0.073	0.037	0.043	0.037	0.026	0.024
Immigrant = 1	0.109	0.120	0.101	0.124	0.140	0.129
FAMILY CHARACTERISTICS						
Jefe = 1	0.421	0.436	0.564	0.346	0.428	0.516
Spouse = 1	0.152	0.142	0.164	0.116	0.118	0.129
Other family member = 1	0.427	0.395	0.272	0.538	0.454	0.355
Mean number of children (<=12)	1.010	1.012	0.961	1.066	1.049	1.019
Mean Number of chldren (13-18)	0.703	0.640	0.561	0.776	0.662	0.569
Single parent household = 1	0.125	0.114	0.091	0.144	0.122	0.099

Fuente: Encuestas de Hogares de Propósitos del Instituto Nacional de Estadística y Censos.

TABLE 10: Proportion of All Workers Who Change Minimum Wage Status Over Time

Variable	Proportion of Workers in Each Sample at Time: t	t+1	t+2	t+3
Relative to Individual MW:				
Stay Below Minimum Wage	29.6%	15.7%	9.2%	6.2%
Move from Below to At or Above Minimum Wage	na	15.4%	20.2%	22.4%
Move from At or Above to Below Minimum Wage	na	14.7%	23.7%	29.4%
Stay At or Above Minimum Wage	70.4%	54.1%	46.9%	42.0%
	t	**t+1**	**t+2**	**t+3**
Relative to *Minimum Minimorum* MW:				
Stay Below Minimum Wage	19.5%	10.2%	7.3%	3.8%
Move from Below to At or Above Minimum Wage	na	10.6%	12.8%	15.3%
Move from At or Above to Below Minimum Wage	na	10.0%	16.1%	19.6%
Stay At or Above Minimum Wage	80.5%	69.2%	63.8%	61.3%

TABLE 11: Characteristics of Workers Who Change Minimum Wage Status

	Proportion of Workers with This Characteristic Who:							
	All Workers				Covered Sector Only			
Variable	Stay Below Minimum Wage	Transition from Below to At or Above MW	Transition from At or Above to Below MW	Stay Above Minimum Wage	Stay Below Minimum Wage	Transition from Below to At or Above MW	Transition from At or Above to Below MW	Stay Above Minimum Wage
JOB CHARACTERISTICS								
Self-employed = 1	0.341	0.295	0.320	0.236	na	na	na	na
Micro Firm (2-5) = 1	0.309	0.240	0.202	0.139	0.539	0.408	0.364	0.246
Small Firm (6-19) = 1	0.126	0.141	0.131	0.123	0.195	0.209	0.208	0.189
Medium and Large Firms (20+)	0.212	0.312	0.339	0.494	0.267	0.382	0.428	0.565
Insured by CCSS = 1	0.473	0.595	0.626	0.780	0.482	0.621	0.671	0.816
Part-time = 1	0.248	0.186	0.318	0.171	0.203	0.157	0.255	0.137
Payment in Kind = 1	0.083	0.089	0.076	0.108	0.131	0.136	0.123	0.147
Belongs to union = 1	0.028	0.041	0.049	0.080	0.013	0.025	0.028	0.042
Belongs to solidarity org = 1	0.031	0.054	0.072	0.129	0.030	0.053	0.079	0.139
Public = 1	0.081	0.122	0.132	0.219	na	na	na	na
Domestic Servant = 1	0.052	0.043	0.046	0.033	0.091	0.075	0.085	0.061
Agriculture = 1	0.311	0.196	0.183	0.089	0.304	0.207	0.209	0.116
Manufacturing = 1	0.156	0.156	0.143	0.147	0.168	0.189	0.184	0.219
Mining = 1	0.001	0.003	0.003	0.003	0.001	0.004	0.003	0.004
Utilities = 1	0.006	0.006	0.009	0.022	0.004	0.003	0.006	0.006
Construction = 1	0.033	0.055	0.061	0.071	0.040	0.048	0.069	0.074
Commerce = 1	0.174	0.191	0.192	0.178	0.175	0.211	0.189	0.201
Hotels = 1	0.047	0.052	0.050	0.042	0.062	0.070	0.068	0.061
Transportation = 1	0.030	0.049	0.054	0.075	0.036	0.050	0.045	0.070
Real Estate = 1	0.035	0.060	0.056	0.063	0.041	0.063	0.059	0.077
Private personal services = 1	0.155	0.175	0.194	0.242	0.076	0.068	0.073	0.084
Finance = 1	0.002	0.012	0.008	0.029	0.002	0.014	0.009	0.028
PERSONAL CHARACTERISTICS								
Rural = 1	0.546	0.419	0.427	0.301	0.544	0.429	0.455	0.327
Region Central	0.562	0.649	0.660	0.745	0.593	0.671	0.667	0.755
Chorotega	0.097	0.075	0.070	0.050	0.091	0.065	0.065	0.043
Pacifico Central	0.055	0.053	0.051	0.044	0.046	0.046	0.053	0.044
Brunca	0.116	0.073	0.065	0.047	0.105	0.063	0.056	0.038
H. Atlantico	0.099	0.096	0.098	0.076	0.100	0.103	0.107	0.082
H. Norte	0.070	0.053	0.055	0.038	0.065	0.051	0.052	0.038
Female = 1	0.347	0.326	0.340	0.305	0.343	0.302	0.319	0.278
No Education	0.055	0.027	0.026	0.015	0.044	0.029	0.025	0.019
Primary Education	0.564	0.465	0.473	0.352	0.586	0.485	0.511	0.399
Secondary Education	0.270	0.315	0.316	0.346	0.295	0.350	0.345	0.376
Tertiaty Education	0.106	0.188	0.182	0.284	0.070	0.133	0.115	0.203
Age 12-19 = 1	0.134	0.093	0.069	0.032	0.199	0.139	0.109	0.049
Age 20-29 = 1	0.246	0.292	0.272	0.229	0.316	0.370	0.356	0.310
Age 30-39 = 1	0.216	0.244	0.259	0.285	0.195	0.238	0.245	0.301
Age 40-49 = 1	0.194	0.216	0.229	0.286	0.156	0.156	0.175	0.228
Age 50-59 = 1	0.128	0.104	0.115	0.136	0.094	0.070	0.087	0.090
Age 60+ = 1	0.082	0.050	0.057	0.031	0.040	0.026	0.029	0.022
Immigrant = 1	0.083	0.081	0.085	0.072	0.089	0.095	0.098	0.096
FAMILY CHARACTERISTICS								
Jefe = 1	0.476	0.612	0.509	0.476	0.387	0.412	0.448	0.562
Spouse = 1	0.118	0.143	0.146	0.142	0.093	0.096	0.100	0.111
Other family member = 1	0.405	0.245	0.345	0.382	0.520	0.493	0.452	0.327
Mean number of children (<=12)	1.069	0.988	1.015	0.984	1.143	1.025	1.065	1.043
Mean Number of chldren (13-18)	0.748	0.680	0.653	0.606	0.837	0.716	0.678	0.603
Single parent household = 1	0.128	0.105	0.104	0.089	0.152	0.116	0.112	0.092

TABLE 12: Variables That Affect the Transition from Above to Below the Minimum Wage

Probit Equations: dependent variable equals 1 if the worker earns at or above the MW at time t and below the MW at time t+1

	Below Individual MW			Below *Minimum Minimorun*	
	All Workers			All Workers	
Variable	dPr/dX	(se)		dPr/dX	(se)
JOB CHARACTERISTICS					
Self-employed = 1	0.060***	(0.0098)		0.049***	(0.0070)
Micro Firm (2-5) = 1	0.048***	(0.0103)		0.043***	(0.0075)
Small Firm (6-19) = 1	0.041***	(0.0100)		0.018***	(0.0069)
Insured by CCSS = 1	-0.044***	(0.0080)		-0.042***	(0.0056)
Part-time = 1	0.070***	(0.0083)		0.044***	(0.0059)
Payment in Kind = 1	-0.049***	(0.0085)		-0.025***	(0.0057)
Belongs to union = 1	-0.003	(0.0127)		-0.018*	(0.0091)
Belongs to solidarity org = 1	-0.022**	(0.0099)		-0.016**	(0.0070)
Public = 1	0.037***	(0.0138)		-0.009	(0.0092)
Domestic Servant = 1	0.089**	(0.0356)		na	
Agriculture = 1	0.222***	(0.0339)		0.261***	(0.0619)
Manufacturing = 1	0.149***	(0.0320)		0.175***	(0.0547)
Mining = 1	0.180**	(0.0734)		0.224**	(0.0935)
Utilities = 1	0.039	(0.0371)		0.149**	(0.0654)
Construction = 1	0.052*	(0.0303)		0.103**	(0.0501)
Commerce = 1	0.121***	(0.0304)		0.135***	(0.0491)
Hotels = 1	0.130***	(0.0353)		0.154***	(0.0585)
Transportation = 1	0.074**	(0.0314)		0.116**	(0.0522)
Real Estate = 1	0.104***	(0.0338)		0.116**	(0.0536)
Private personal services = 1	0.109***	(0.0284)		0.119***	(0.0448)
PERSONAL CHARACTERISTICS					
Rural = 1	0.038***	(0.0062)		0.026***	(0.0042)
Chorotega	0.044***	(0.0111)		0.029***	(0.0078)
Pacifico Central	0.003	(0.0101)		0.012*	(0.0070)
Brunca	0.029***	(0.0106)		0.020***	(0.0071)
H. Atlantico	0.022**	(0.0104)		0.025***	(0.0072)
H. Norte	0.010	(0.0124)		0.013	(0.0083)
Female = 1	0.036***	(0.0092)		0.028***	(0.0065)
Years of Education	-0.008***	(0.0009)		-0.012***	(0.0006)
Age 12-19 = 1	0.056***	(0.0177)		0.035***	(0.0120)
Age 20-29 = 1	0.035***	(0.0099)		0.005	(0.0064)
Age 30-39 = 1	0.015*	(0.0082)		-0.001	(0.0054)
Age 50-59 = 1	0.005	(0.0100)		0.012*	(0.0070)
Age 60+ = 1	0.071***	(0.0178)		0.036***	(0.0120)
Immigrant = 1	0.017	(0.0110)		0.006	(0.0073)

TABLE 12 (continued)						
Variable						
FAMILY CHARACTERISTICS						
Spouse = 1	0.012	(0.0110)		0.008	(0.0079)	
Other family member = 1	0.086***	(0.0096)		0.049***	(0.0067)	
Number of children (<=12)	0.004	(0.0027)		0.003*	(0.0017)	
Number of chldren (13-18)	-0.002	(0.0034)		-0.002	(0.0023)	
Single parent household = 1	0.005	(0.0108)		0.017**	(0.0078)	
TIME DUMMY VARIABLES						
2002 = 1	0.016	(0.0107)		-0.010	(0.0065)	
2003 = 1	0.021*	(0.0109)		-0.004	(0.0067)	
2004 = 1	0.051***	(0.0110)		0.010	(0.0069)	
2005 = 1	0.043***	(0.0107)		0.022***	(0.0071)	
2006 = 1	0.008	(0.0100)		-0.009	(0.0062)	
Number of Observations	21306			23194		
Log Likelihood	-10253			-7374		
Notes: Standard errors in parentheses,						
*** p<0.01, ** p<0.05, * p<0.1						
Contributes to CCSS insurance is a dummy variable equal to 1 if the employer pays for CCSS						
insurance, if the worker is covered by a "convenio," or if self-employed workers contribute						
voluntarily to the CCSS.						

TABLE 13: Variables That Affect the Transition from Below to Above the Minimum Wage					
Probit Equations: dependent variable equals 1 if the worker earns below the MW at time t and above the MW at time t+1					
	Below Individual MW			**Below *Minimum Minimorun***	
	All Workers			All Workers	
Variable	dPr/dX	(se)		dPr/dX	(se)
JOB CHARACTERISTICS					
Self-employed = 1	-0.071***	(0.0170)		-0.125***	(0.0223)
Micro Firm (2-5) = 1	-0.099***	(0.0168)		-0.164***	(0.0220)
Small Firm (6-19) = 1	-0.053***	(0.0183)		-0.085***	(0.0261)
Insured by CCSS = 1	0.052***	(0.0127)		0.044***	(0.0156)
Part-time = 1	0.008	(0.0134)		-0.012	(0.0156)
Payment in Kind = 1	0.021	(0.0197)		0.024	(0.0272)
Belongs to union = 1	-0.013	(0.0326)		-0.093*	(0.0565)
Belongs to solidarity org = 1	0.031	(0.0288)		0.028	(0.0531)
Public = 1	0.022	(0.0284)		0.096*	(0.0496)
Domestic Servant = 1	-0.182***	(0.0684)		na	
Agriculture = 1	-0.291***	(0.0653)		-0.187	(0.1808)
Manufacturing = 1	-0.235***	(0.0638)		-0.072	(0.1849)
Mining = 1	0.021	(0.1257)		0.111	(0.2083)
Utilities = 1	-0.314***	(0.0649)		-0.102	(0.2088)
Construction = 1	-0.096	(0.0735)		0.027	(0.1871)
Commerce = 1	-0.194***	(0.0668)		-0.104	(0.1834)
Hotels = 1	-0.166**	(0.0690)		-0.068	(0.1865)
Transportation = 1	-0.154**	(0.0706)		0.000	(0.1897)
Real Estate = 1	-0.134*	(0.0715)		0.015	(0.1904)
Private personal services = 1	-0.269***	(0.0609)		-0.160	(0.1764)
PERSONAL CHARACTERISTICS					
Rural = 1	-0.059***	(0.0124)		-0.071***	(0.0171)
Chorotega	-0.047***	(0.0174)		-0.019	(0.0221)
Pacifico Central	0.003	(0.0188)		0.020	(0.0232)
Brunca	-0.083***	(0.0161)		-0.074***	(0.0200)
H. Atlantico	0.027	(0.0181)		0.036*	(0.0219)
H. Norte	-0.018	(0.0216)		0.044*	(0.0266)
Female = 1	-0.112***	(0.0158)		-0.105***	(0.0223)
Years of Education	0.012***	(0.0018)		0.019***	(0.0026)
Age 12-19 = 1	-0.025	(0.0247)		-0.025	(0.0308)
Age 20-29 = 1	0.023	(0.0183)		0.057**	(0.0242)
Age 30-39 = 1	0.016	(0.0162)		0.033	(0.0209)
Age 50-59 = 1	-0.040**	(0.0194)		-0.039	(0.0241)
Age 60+ = 1	-0.116***	(0.0239)		-0.087***	(0.0283)
Immigrant = 1	0.002	(0.0200)		-0.028	(0.0248)

TABLE 13 (continued)						
Variable						
FAMILY CHARACTERISTICS						
Spouse = 1	0.060***	(0.0204)		0.030	(0.0280)	
Other family member = 1	-0.064***	(0.0161)		-0.075***	(0.0213)	
Number of children (<=12)	-0.008*	(0.0047)		-0.010*	(0.0057)	
Number of chldren (13-18)	0.001	(0.0063)		-0.004	(0.0076)	
Single parent household = 1	-0.002	(0.0184)		-0.007	(0.0240)	
TIME DUMMY VARIABLES						
2002 = 1	0.013	(0.0201)		0.091***	(0.0246)	
2003 = 1	-0.025	(0.0204)		0.044*	(0.0261)	
2004 = 1	-0.033*	(0.0191)		0.032	(0.0242)	
2005 = 1	-0.063***	(0.0184)		-0.031	(0.0240)	
2006 = 1	0.030	(0.0182)		0.101***	(0.0227)	
Number of Observations	9635			6082		
Log Likelihood	-6322			-3923		
Notes: Standard errors in parentheses,						
*** p<0.01, ** p<0.05, * p<0.1						
Contributes to CCSS insurance is a dummy variable equal to 1 if the employer pays for CCSS						
insurance, if the worker is covered by a "convenio," or if self-employed workers contribute						
voluntarily to the CCSS.						

TABLE 14: Correlations Between Transitions Out of Poverty and Earning Below or Above the Legal Minimum Wage							
Transition out of poverty: Dependent Variable = 1 if family transitions from poor to non-poor							
					Poverty		**Extreme Poverty**	
					dPr/dX	**Std Err**	**dPr/dX**	**Std Err**
Relative to Individual Minimum Wage								
Worker transitions from below to above Individual MW					0.287***	(0.017)	0.294***	(0.027)
Worker transitions from above to below Individual MW					-0.170***	(0.025)	0.019	(0.052)
Relative to *Minimum Minimorum* MW								
Worker transitions from below to above Minimum MW					0.160***	(0.021)	0.218***	(0.06)
Worker transitions from above to below Minimum MW					-0.322***	(0.028)	-0.143*	(0.075)