THE WILLIAM DAVIDSON INSTITUTE
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The Impact of Minimum Wages on Wage Inequality and Employment in the Formal and Informal Sector in Costa Rica

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Abstract:

This paper tests the impact of the Costa Rican minimum wage policy on wage inequality and the level of employment in the formal sector (covered by minimum wage legislation) and the informal (uncovered) sector. We also examine the redistributive effects of the minimum wage, between the covered sector and the uncovered sector. Regression analysis using micro data from the *Labour Force Surveys* over 17 years reveals three important findings. At the median, a unit increase in the minimum wage relative to the average wage is associated with:

a) a reduction in wage inequality in the covered sector of between 0.9 percent (using the Gini) and 1.7 percent (using the Theil mean logarithmic deviation) and there is no effect on earnings inequality among the self-employed (using all measures);
b) an increase in the level of covered sector employment by 0.56 percent, but no effect on the number of self-employed over time;
c) an increase in the average number of hours worked per week by 0.14 percent in the covered sector and 0.34 percent in the uncovered sector.

From a theoretical perspective, these finds are counter to the traditional competitive two-sector models of the minimum wage. We interpret them as supporting the monopsonistic and efficiency wage models of the labour market in those industries where the ratio of the minimum wage to the average wage ("toughness") is low but supports the traditional models in those industries where toughness is high. Given that we found overall employment to have increased, minimum wages could be seen as assisting the reallocation of labour from the traditional to the more modern sectors.

Keywords: minimum wages, employment, wage inequality, monopsony, Costa Rica

1. INTRODUCTION

Minimum wage policies have always been controversial among economists and policy makers and the debate has become more heated following the recent publication of the book by Card and Krueger (1995) and related papers (e.g., Katz and Krueger, 1992; Card and Krueger, 1994). Supporters of minimum wages justify them as a way of improving the living conditions of the poor, unskilled, unorganised workers. Critics emphasize the efficiency losses associated with their use, and disqualify them as an adequate way of affecting inequality. They argue that in developing countries minimum wages are the principal source of labour market segmentation and unemployment.

The traditional view, using the standard two-sector model which assumes a perfectly competitive labour market with homogeneous and mobile labour, is that an increase in the minimum wage, reduces employment in the covered sector, creates unemployment, and has "negative" spillover effects in the uncovered sector (i.e., increasing employment there and putting downward pressure on wages at the lower end of the distribution).[1] Hence increasing the minimum wage should increase income inequality in the uncovered sector and reduce it in the covered sector.

On the other hand if minimum wages do not reduce employment in the covered sector and hence have no spillover effects (the outcome in a monopsonistic model of the labour market), changes in minimum wages will not have an efficiency loss and may not effect wage inequality in the uncovered sector.[2] If employment actually increases in the covered sector as a result of minimum wage increase, and draws low wage workers from the uncovered sector, then one might expect earnings inequality to fall in the uncovered sector. Until the Card and Krueger (1994, 1995) and related research, which found a positive effect of the minimum wage on

employment in the US, monopsony was not a very popular model of the labour market. Dickens et al. (1999, p.2) argue that monopsony may be more common than we have traditionally believed from the one-company town examples: "For example, in most labour markets employers that cut wages do not instantaneously lose all their workers, so the supply of labour to a firm is not perfectly elastic, and firms therefore posses some monopsony power… in the short and long run."

Our paper examines the effects of changes in the minimum wage on earnings inequality and aggregate level of employment in Costa Rica's covered and uncovered sectors over the 1980-92 period. We also examine whether changes in the minimum wage lead to a reallocation of labour between the covered and uncovered sector.

There are a number of features about Costa Rica that make it an interesting country for the analysis of minimum wages and inequality in the two sectors. For one there is a significant group, approximately one-fifth of the employed, who are not covered by minimum wages. These are self-employed ("informal sector") workers.[3] Second, unlike most countries, Costa Rica has multiple minimum wages, set for various occupations and industries. In the 1970s and early 1980s there were approximately 350 minimum wages and in 1990 the number was reduced to about 80. Setting the minimum at different levels by occupation and industry could but need not be more a more effective instrument for raising the wage floor and reducing wage inequality than one minimum wage. However, the Costa Rican National Salary Council has taken an additional step of systematically raising the lowest minimum wages by a greater percentage than it raised the higher minimum wages over the 1980's and 1990's. Moreover, the Council did not allow minimum wages to erode over the 1980s as was the case in most Latin American countries (especially Ecuador, Mexico, and Peru). As seen in Figure 1, the plot of the lowest minimum

wage in each industry as a percent of the average wage of covered sector workers in each industry over the 1976-1992 period reveals that minimum wages have been fairly stable and relatively high (the median is 55% of the average wage) when compared to other countries. Hence, one would expect from the manner in which minimum wages are designed and changed over time, that minimum wages would reduce inequality among Costa Rican workers in the covered sector. Their impact on the uncovered sector depends on whether the labour market is competitive or monopsonistic.

2. METHODOLOGY

2.1 Inequality

There are many ways to measure wage inequality; we have used three widely accepted measures. First, the coefficient of variation,

$$CV = \frac{\sigma_x}{\overline{Y}} = \frac{\sqrt{\sum_{i=1}^{n} (\overline{Y}i - \overline{Y})^2 / n}}{\overline{Y}} \qquad (1)$$

where Y_i is the earnings/wage of person ***i*** in the population, ***n*** represents the number of people in the population, and $\overline{Y}$ is the mean wage in the population.

The second indicator we use is the most common measure of wage inequality, namely the Gini coefficient:

$$G = 1 + 1/n - 2/n^2 \overline{Y} \; [Y_1 + 2Y_2 + 3Y_3 + \ldots + nYy_n] \qquad (2)$$

where ***n*** and $\overline{Y}$ as before, and $Y_1, 2Y_2, \ldots nY_n$. is the individual income in decreasing order of size.

The third measure we have selected is the Theil mean logarithmic deviation:[4]

$$T = (1/n)\sum_{i=1}^{n} \log\left(Y_i \big/ \overline{Y}\right) \qquad (3)$$

The measures differ in their sensitivity to income variations at different levels of the distribution. For equi-distant transfers, the Gini index is considered to be more sensitive to changes around the mode, while the coefficient of variation is more sensitive to transfers at the top of the distribution. The mean logarithmic deviation is relatively more responsive to changes at the lower end of the distribution.

To test whether the level of the minimum wage and changes in the minimum wage affect wage dispersion in the covered and the uncovered sectors, we estimate the following equation separately for the covered and uncovered sectors:

$$lnD_{it} = \alpha_o + \alpha_1 (MW_i/W_i)_t + \sum_{i=1}^{6} \beta_i I_i + \sum_{t=1}^{12} \gamma_t T_t + \mu \qquad (4)$$

where the subscripts $\boldsymbol{i} = 1 \ldots 7$ are for each industry,[5] and $\boldsymbol{t} = 1 \ldots 13$ for years (1980–1992) and:

- ***D= CV,G,T*** is a measure of hourly wage dispersion within an industry and sector in each of the 13 years.
- ***MW/W*** is the lowest average hourly minimum wage set by the government for each industry divided by the average hourly wage in each industry. This variable captures the "toughness" of the minimum wage.
- ***I*** are industry specific dummies, with domestics as the base.
- ***T*** are annual dummies for 1980-1992.

Industry and time dummies are added to control for industry and time fixed effects, such as changes in aggregate output and shocks over time. We also test whether the impact of the minimum wage is non-linear (with a quadratic specification) and whether the minimum wage has a lagged effect, using a one-year lag.

2.2 Employment Effects

To estimate the employment affect of the minimum wage we estimate separate regressions for the covered and uncovered sector workers using two different measures as a dependent variable: a) the log of the number employed (by industry and year) and b) the total number of hours worked in an average week (by industry and year). These measures allow us to learn about the reallocation of workers and hours worked across industries over time. We also examine whether there is a reallocation of labour within an industry between covered and uncovered employment as the "toughness" of minimum wages rises. For this we use the percent working in the covered sector in each industry (and year) as a dependent variable. All three of these measures are regressed on various specifications of the "toughness" measure with industry and time fixed effects.

2.3 Data

The analysis is based on aggregated data from the Costa Rican annual *Household Survey of Employment and Unemployment (HSEU)*. The minimum wage data were taken from the *Gazetta* published by the Ministry of Labor. Since it was not possible to match the occupational codes in the HSEU with those in the *Gazetta*, we have selected the lowest minimum wage in each one-digit industrial sector as our benchmark. The toughness measure used in our analysis is plotted in Figure 1. In the regression analysis we were not able to use the data from the 1976-1979 household surveys because no questions were asked to distinguish self-employment from other forms of employment in 1977-79.

3. FINDINGS

3.1 Trend of the Wage Inequality (1976–1992)

In Figure 2 we present plots of the three measures of inequality in the hourly labour earnings of all workers. In Figure 3 we plot these measures for the covered and uncovered workers. The plots reveal the following patterns:

a) *Earnings inequality for the whole population fell over the 1982–1992 period*. This is the case for all three measures of inequality but the decline is most dramatic in the coefficient of variation. (Inequality was very high in 1981-1982 when there was very high inflation.)

b) *The hourly earnings of covered workers are distributed more equally than those of the uncovered sector* in every year.

c) The level of earnings inequality fell by a greater percentage in the covered sector than in the uncovered sector.

An examination of the Gini for the covered and uncovered/self-employed workers in each of the seven industries (Figures 4 and 5, respectively) indicate the same overall declining pattern, but a more erratic pattern among the industries in 1981 and 1982, when inflation was high. It is also noteworthy that the relative level of inequality among the industries is not consistent across the covered and uncovered sectors.

3.2 Inequality Results

The results from estimating equation (4) with the three measures of wage dispersion are presented in Table 1. Panel A contains the coefficients from the regression using the coefficient of variation as the dependent variable, Panel B contains the findings using the Gini and Panel C presents the results for the Theil mean log deviation measure.

The main finding is striking: *up to a point an increase in the industry specific minimum wage relative to industry average wages, reduces wage inequality in the covered sector when inequality is measured with the Gini and the Theil mean log deviation. However, it has no effect on the covered sector when measured with the coefficient of variation. The toughness measure has no impact on the earnings inequality of the self-employed in all three regressions.* The effect on the covered sector is non-linear and it is decreasing at a decreasing rate.[6] As seen in Table 2, at the lowest level of toughness we find in the data (30 percent), a one percentage point increase in the toughness measure reduces inequality by 2 to 3 percent, depending on which measure is used. A unit increase at the median level of toughness (55.5 percent) reduces inequality between 0.9 and 1.7 percent but at the highest level of toughness (89 percent) a one-percentage point increase actually increases inequality (but only by 0.4 to 0.6 percent). Hence as long as the minimum wage is not set "too high," it reduces inequality.[7] One explanation offered for this is that enforcement is even less stringent when the minimum is very high.

3.3 Employment

Contrary to the traditional view, we find that up to a point minimum wage increases are associated with increases in the level of total and covered sector employment (see Table 3). We find no statistically significant correlation between the toughness of the minimum wage and the number of self-employed. The relationship between the minimum wage toughness measure and the level of employment is non-linear (for both total and covered sector): an increase in the toughness of the minimum wage increases employment at a decreasing rate.[8] As seen in Table 4, total employment rises by 1.1 percent and covered sector employment rises by 1.3 percent when the toughness measure rises from 30 to 31 percent. The employment effect is positive until the toughness measure reaches between 68 and 75 percent (for total employment and covered sector

employment, respectively). At that point further increases in the minimum wage reduce employment. At the highest level of toughness observed in Costa Rica over this period, a one percentage point increase lowers total employment by 0.6 percent and covered sector employment by 0.4 percent.

These findings may be interpreted as supporting the monopsonistic model, which predicts that increases in wages can increase employment up to the point where the marginal cost is equal to the marginal revenue. Any increases above that point force the employer to be on his/her demand curve. However, it is difficult to imagine a labour market for unskilled workers as functioning as in the monopsonistic model. Hence, another plausible interpretation of these findings is that they support the traditional model of the labour market for less skilled workers and the monopsonistic or efficiency wage models for the skilled workers. In particular, industries that use unskilled labour and pay low wages have a high ratio of minimum to actual wage (i.e., high toughness). Firms in these industries face an elastic supply of labour and when a rise in minimum wage forces these firms to move up their demand for labour curves and lay off workers. This is consistent with the negative employment effect documented in Tables 3 and 4. On the other hand, industries that employ relatively more skilled labour (and where capital intensity may be higher), have a low ratio of the minimum to the average wage (i.e., low toughness). These are also the industries that are likely to face upward sloping supply curve of labour or where employers may pay efficiency wages so as to attract and keep skilled workers. In these industries an increase in the minimum wage may be expected to raise employment under the monopsonistic or efficiency wage scenario. This is consistent with the positive effect of increasing minimum wage on employment found for these industries in Tables 3 and 4.[9]

Our empirical estimates are hence consistent with the view that the minimum wage increases assist in reallocating labour from the "traditional" to the "modern" sector in the spirit of the Lewis model. The high wage (modern sector) firms would not raise wages and employment unless induced to do so by the minimum wage increase. The low wage (traditional sector) firms in turn release labour that migrates to the expanding high wage (modern) sector. The story is appealing but needs fine tuning in terms of explaining skill compatibility between the two sectors.

Turning to our findings on the impact of minimum wages on the number of hours worked in an average week, we find that up to a point, increases in the minimum wage are positively correlated with the toughness of the minimum wage in both the covered and uncovered sector (Table 5). Moreover, the impact is much greater (and more highly significant) among the self-employed workers. Whereas at the lowest toughness level a one percentage point increase in toughness increases number of hours worked by covered sector workers by 0.4 percent, it increases the number of hours worked in self-employment by 1.2 percent see Table 6). Hence, although the number of self-employed workers do not change with changes in the minimum wage relative to average wage, the number of hours of the self-employed do change. As with the impact on employment, once the minimum wage toughness reaches 66 to71 percent of the average wage in the industry, the number of hours worked in the covered sectors begins to fall and at the highest level it falls by 0.2 percent in the covered sector and 0.8 percent among the self employed. Tests for longer term effects show that the estimated coefficients on one year lagged toughness variable are not significant when entered in addition to the current measure of toughness.

3.4 Reallocation of workers between the covered and uncovered sector, within an industry

Our analysis of the allocation of workers between the covered and uncovered sectors within an industry indicates that as minimum wages rise relative to average wages in an industry, the

percentage of workers in the covered sector will rise (see Table 7). The short-run impact is marginally statistically significant (with P value of 0.113) and indicates a linear effect of 0.19 percent increase in the percentage of covered sector workers. This of course relates to the findings in Table 1, where increases in the toughness of the minimum wage increases the number of covered sector workers (up to a point) but seems to leave the number of self employed unchanged. However, we also have the interesting finding that the coefficient on the lagged value of toughness is significant (at the five percent level) and indicates that a one percentage point increase in toughness in one year will raise the percent of workers in the covered sector by 0.29 percent in the following year. Hence the redistribution of labour from the informal to the formal sector within each industry, brought about by increases in the minimum wage, is significant and long term. This is counter to the traditional view that increases in the minimum wage enlarge the informal sector.

4. SUMMARY AND CONCLUSIONS

The purpose of this paper is to test whether the Costa Rican government is reaching its goal of reducing wage inequality while at the same time not reducing significantly the level of employment in the covered sector with the use of a complicated minimum wage policy. We also examine the redistributive effects of the minimum wage between the covered and the uncovered (self-employed) sectors.

Costa Rica has a complex system of minimum wages that are industry and occupation specific. Over the 1980s and 1990s, the government has been systematically raising the lowest minimum wages by a higher percentage than the higher minimum wages. We show that minimum wages in Costa Rica have been maintained at relatively high levels with respect average wages (the median is 55.5 percent) over this period. Moreover, unlike most of the Latin

America countries, this ratio has risen in the 1980s compared to the 1970s. We find a declining trend in overall inequality (using three measures) over the 1980–1992 period. We also find that the level of wage (earnings) inequality among covered sector workers is lower than among the uncovered sector workers. Finally, inequality has declined more rapidly in the covered sector than that in the uncovered sector.

Regression analysis reveals that at the median, a unit increase in the minimum wage relative to the average wage in the industry is associated with: a) a reduction in wage inequality in the covered sector of between 0.9 percent (using the Gini) and 1.7 percent (using the Theil mean logarithmic deviation) and no effect on earnings inequality among the self-employed (using all measures); b) an increase in the level of covered sector employment by 0.56 percent and total employment by 0.35 percent, but has no effect on the number of self-employed; c) an increase in the average number of hours worked per week by 0.14 percent in the covered sector and 0.34 percent in the uncovered sector; and d) a raise in the percentage of covered sector workers within an industry by 0.29 percent one year after the minimum wage is increased. Hence, the Costa Rican government does appear to be accomplishing its goal and its policy also seems to be assisting the reallocation of workers from the self-employed (informal) sector to the covered (formal) sectors counter to the traditional view.

From a theoretical perspective, these finds are counter to the traditional competitive two-sector models of the minimum wage. We interpret these findings as supporting the monopsonistic and efficiency wage models of the labour market in those industries where the ratio of the minimum wage to the average wage ("toughness") is low but supports the traditional models in those industries where toughness is high. Hence, workers in traditional industries (with low average wages) are losing jobs whereas workers in more modern industries (with high

average wages) are gaining jobs. Given that we found overall employment to have increased, minimum wages could be seen as assisting the reallocation of labour from the traditional to the more modern sectors.

Notes

[1]See for e.g., Brown (1999) for a description of this model.

[2]See for e.g., Card and Krueger (1995) and Rebitzer and Taylor (1995).

[3]In this paper we use the terms 'informal sector' and 'self-employed' interchangeably.

[4]For further definitions see Coulter et al. (1992).

[5]The seven industrial sectors are: agriculture, manufacturing, construction, transportation, commerce and finance, services and domestics. Domestic servants were singled out since they are a large group (about 10%) of the work force.

[6]Tests for other specifications of the equation indicated that neither the coefficients for the linear toughness specification nor those for the lagged toughness specification were not significantly different from zero for either sector.

[7]The turning point is when minimum wages were about 79-81 percent of the average wage in the industry.

[8]The coefficient on toughness was not significant either in the linear specification or the lagged specification (when the lagged term was entered in addition to the current term).

[9]Note that in the monopsonistic model a rise in the minimum wage results in an increase in employment as the firm moves rightward along the supply curve of labour. The positive effect will of course be reversed when one reaches the point of intersection of labour supply and demand and further wage increases will result in a backward movement along the employer's demand curve.

Table 1:
Effect of Minimum Wage on Wage Dispersion

	Covered Sector	Self-Employed
Panel A: log of coefficient of variation		
Toughness	-0.015	-0.0039
	(0.015)	(0.0158)
Toughness^2	0.00008	0.00005
	(0.00010)	(0.00011)
Time Dummies	Yes	Yes
Industry dummies	Yes	Yes
Adjusted R^2	0.80	0.77
Panel B: log of Gini		
Toughness	-0.0315 [a]	-0.015
	(0.013)	(0.013)
Toughness^2	0.0002 [b]	0.0001
	(0.0001)	(0.0001)
Time Dummies	Yes	Yes
Industry dummies	Yes	Yes
Adjusted R^2	0.73	0.79
Panel C: Theil mean log deviation		
Toughness	-0.055 [b]	-0.034
	(0.025)	(0.031)
Toughness^2	0.00034 [c]	0.00029
	(0.00018)	(0.00022)
Time Dummies	Yes	Yes
Industry Dummies	Yes	Yes
Adjusted R^2	0.69	0.60
No. of Observations	91	91

[a]Significant at the 1% level; [b]significant at the 5% level; [c]significant at the 10% level.

Table 2:
Impact of Changes in the Toughness of the Minimum Wage on Inequaltiy

	Range of Toughness Measure		
	Lowest	Median	Highest
Increase in	(30.0)	(55.5)	(89.0)
Gini	-0.0195	-0.0093	0.0041
Theil	-0.0346	-0.0173	0.00552

Table 3:

Impact of Minimum wages on the Log of Employment

	Total employment	**Covered Sector Employment**	**Self-Employment**
Toughness	0.019 [c]	0.0211 [c]	0.016
	(0.011)	(0.0118)	(0.19)
$(\text{Toughness})^2$	-0.00014 [c]	-0.00014 [c]	-0.00018
	(0.00007)	(0.00009)	(0.00014)
Time Dummies	yes	yes	yes
Industry Dummies	yes	yes	yes
Adjusted R^2	0.97	0.97	0.97
No. of Observations	91	91	91

[a]Significant at the 1% level; [b]significant at the 5% level; [c]significant at the 10% level.

Table 4:
Impact of Changes in the Toughness of the Minimum Wage on Employment

	Range of Toughness Measure		
	Lowest	Median	Highest
Increase in	(30.0)	(55.5)	(89.0)
Tot. Emp.	0.0106	0.00346	-0.0059
Cov. Emp.	0.0127	0.00556	-0.0038

Table 5: Impact of Minimum Wages on the Log of the Number of Hours Worked

	Total Economy	**Covered Sector**	**Self-Employment**
Toughness	0.0055	0.0064 [c]	0.0223 [b]
	(0.0035)	(0.0035)	(0.0091)
$(\text{Toughness})^2$	-0.00004	-0.000045 [c]	-0.00017 [b]
	(0.00003)	(0.000025)	(0.000066)
Time Dummies	yes	yes	yes
Industry Dummies	yes	yes	yes
Constant	3.503 [a]	3.508 [a]	2.835 [a]
	(0.132)	(0.130)	(0.334)
Adjusted R^2	0.80	0.80	0.79
No. of Observations	91	91	91

[a]Significant at the 1% level; [b]significant at the 5% level; [c]significant at the 10% level.

Table 6:
Impact of Changes in the Toughness of the Minimum Wage on Hours Worked

	Range of Toughness Measure		
Increase in Hours of Work of	Lowest (30.0)	Median (55.5)	Highest (89.0)
Covered Sector	0.0037	0.00141	-0.0016
Self-employed	0.0121	0.00343	-0.0080

Table 7: Impact of Minimum Wages on the Relative Level of Employment in the Covered Sector (Percent Covered)

	(1)	(2)	(3)
Toughness	0.019 *	0.0018	0.0018
	(0.012)	(0.0035)	(0.0037)
$(\text{Toughness})^2$		3.40e-07	5.89e-06
		(0.000025)	(0.00003)
Lag toughness			0.0029[b]
			(0.0012)
Time Dummies	yes	yes	yes
Industry Dummies	yes	yes	yes
Constant	4.32 [a]	4.33 [a]	4.25[a]
	(0.06)	(0.12)	(0.12)
Adjusted R^2	0.89	0.89	0.90

*P=0.113
[a]Significant at the 1% level; [b]significant at the 5% level;
[c]significant at the 10% level.

Figure 1: Minimum Wage/Wage "Toughness" by Industry

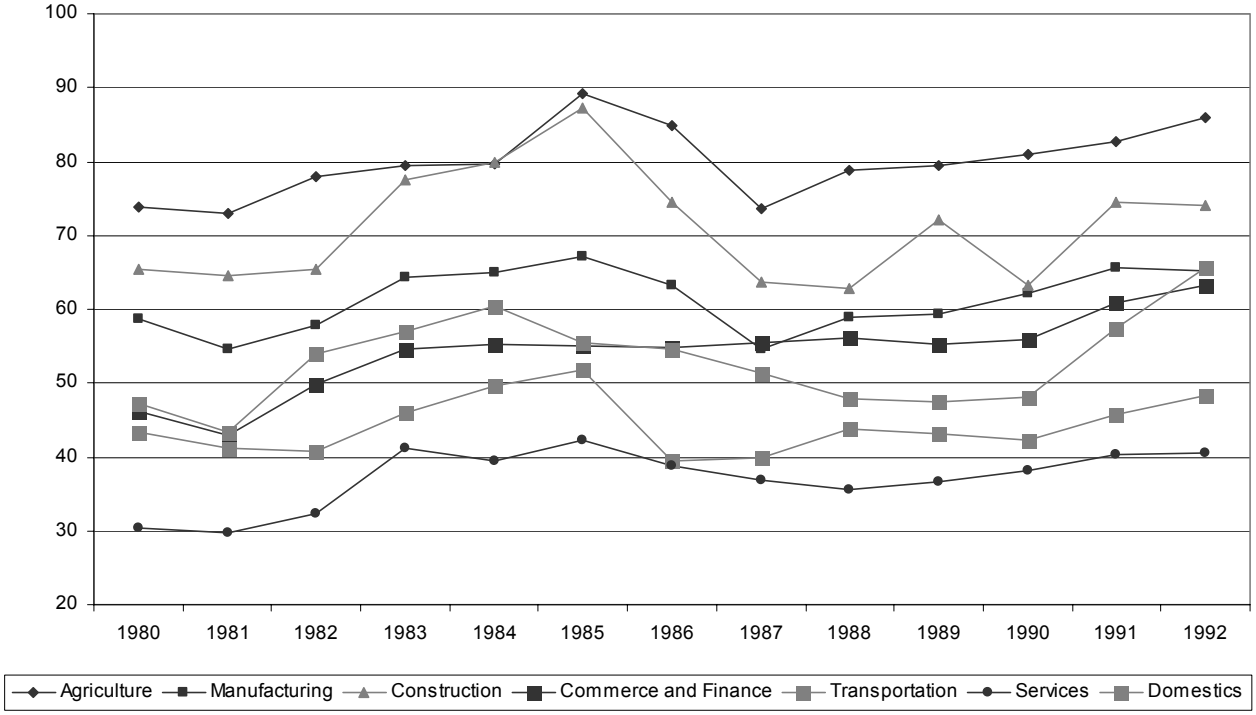


Figure 2: Inequalities for Costa Rica, Total Population

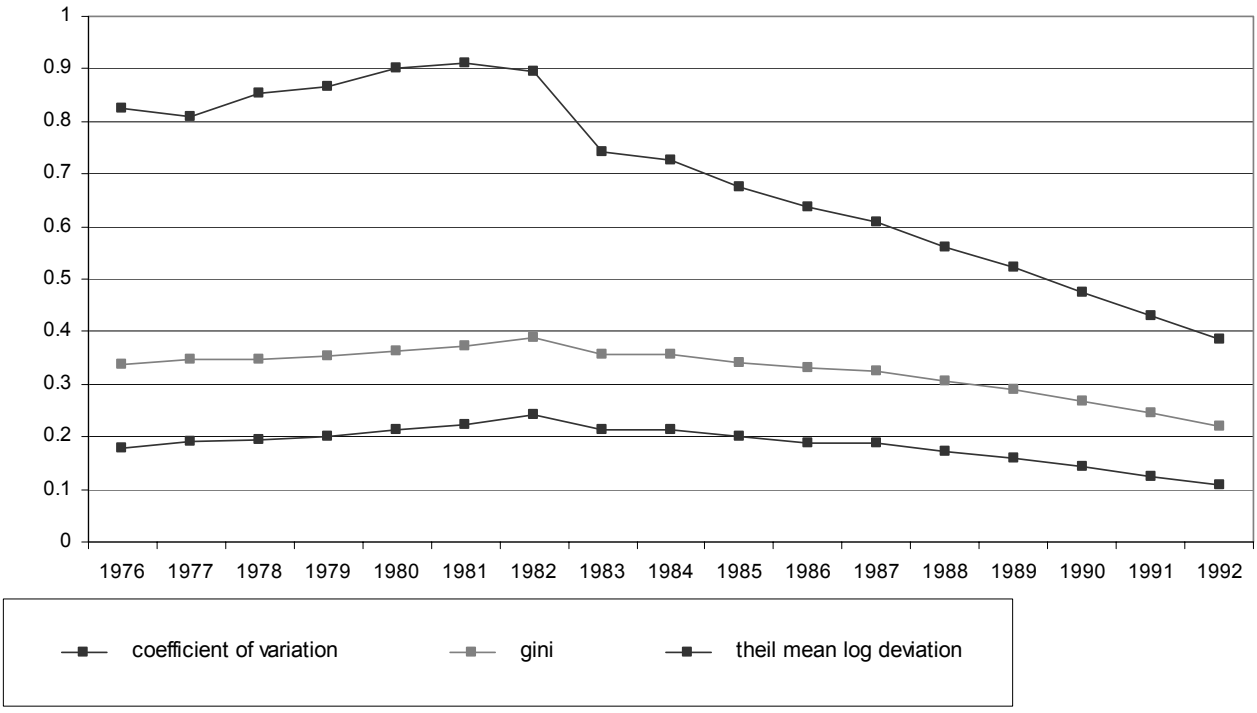
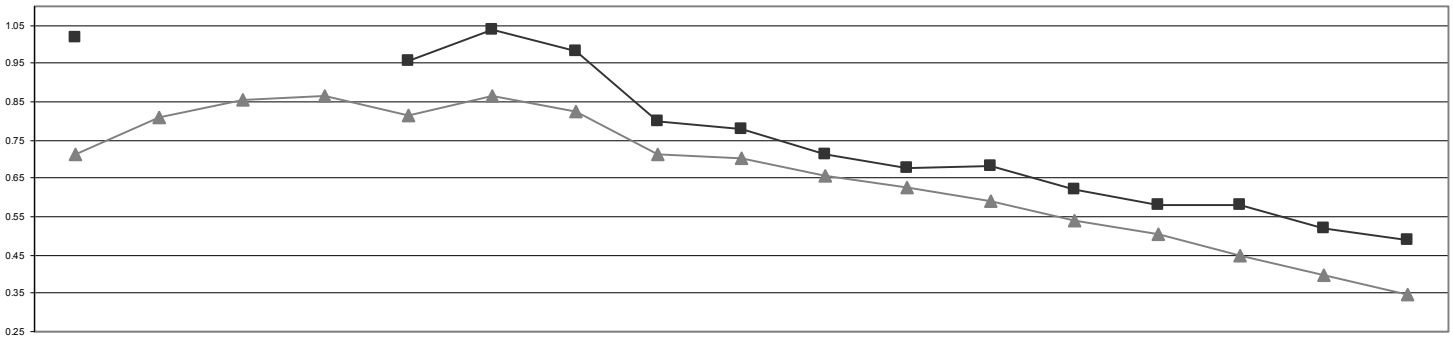
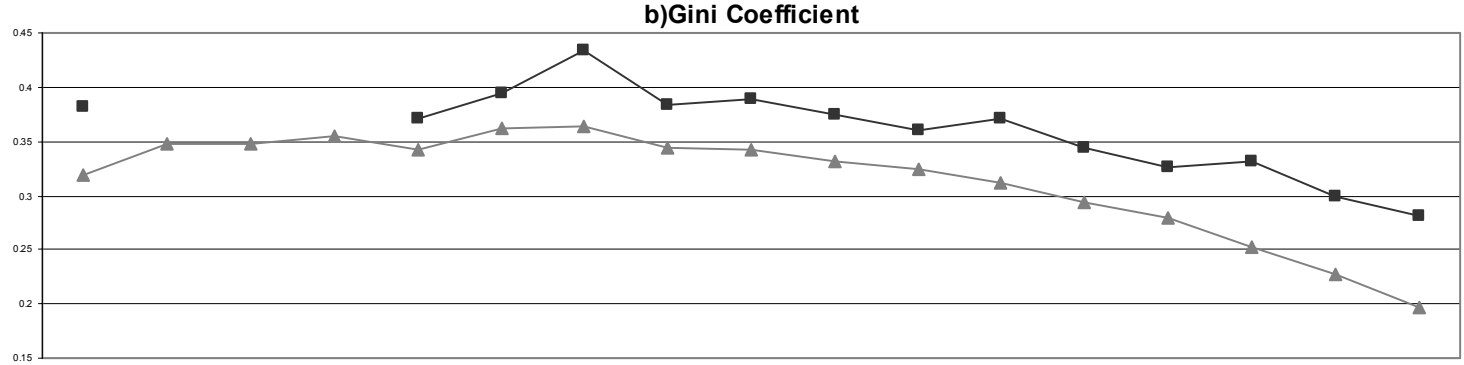


Figure 3: Wage Inequality in Costa Rica Covered Sector vs. Self-Employed

a) Coefficients of Variation



b)Gini Coefficient



c) Theil Coefficient

Figure 4: Gini for Covered Sector Workers, by Industrial Activity

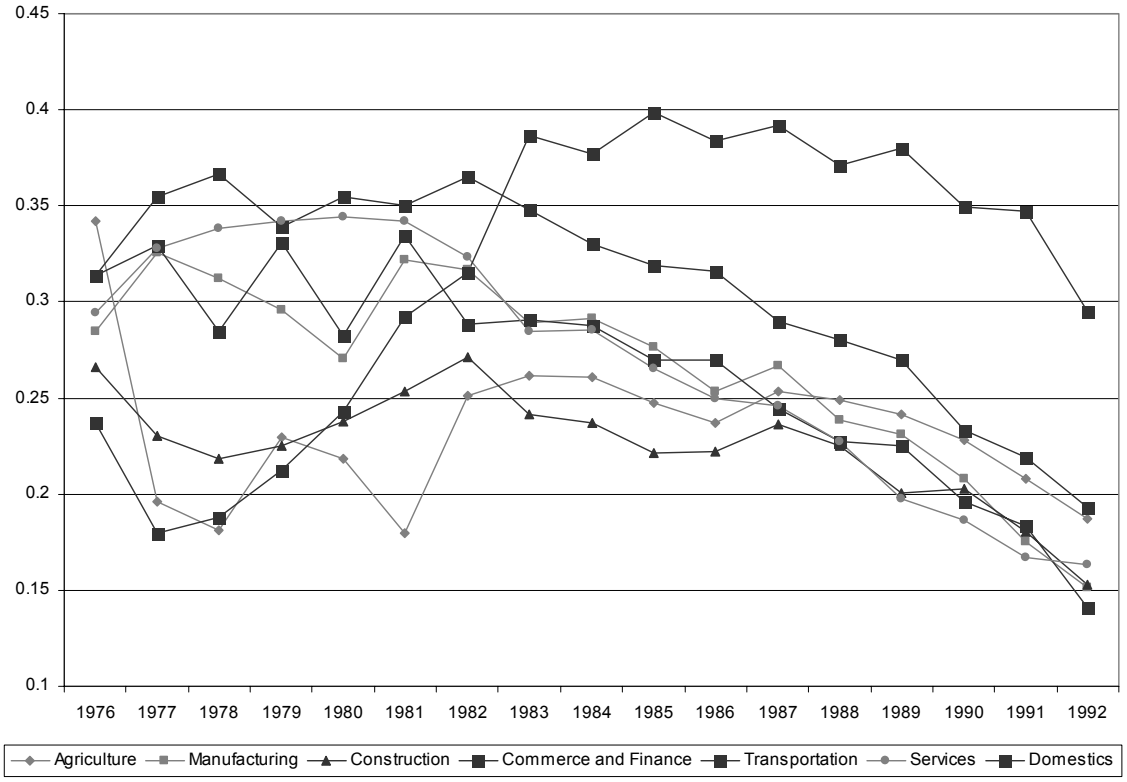
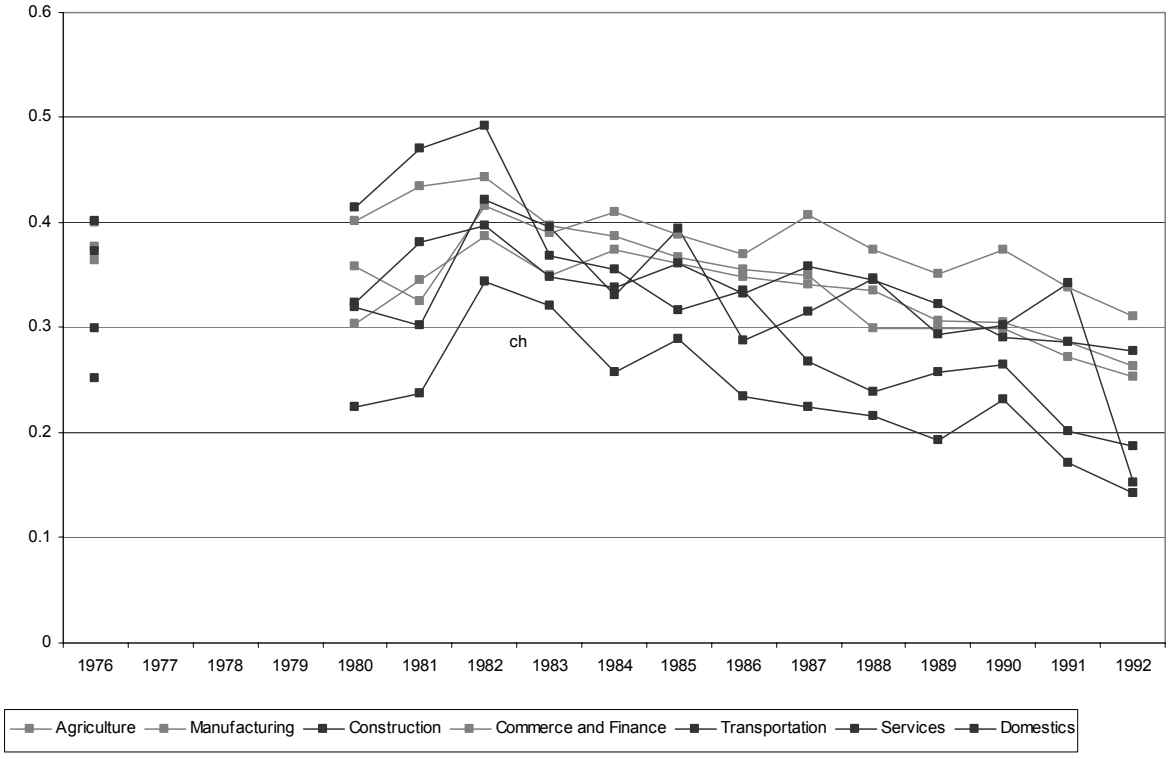


Figure 5: Gini for the Self-Employed by Industrial Activity



References

Bell, L. (1997) 'The Impact of Minimum Wages in Mexico and Colombia,' *Journal of Labor Economics,* vol. 15, no. 3, July, pp. S102-S134.

Brown, C. (1999) 'Minimum Wages, Employment, and the Distribution of Income,' in O. Ashenfelter (ed.) *Handbook of Labor Economics*, forthcoming.

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

_____ (1994) 'Minimum Wages and Employment: A study of the Fast-Food Industry in New Jersey and Pennsylvania,' *American Economic Review*. Vol. 84, (), pp. 772-793.

Coulter, Fiona, A. E., Cowell, F. A. and Jenkins, S. P. (1992) 'Differences in Needs and Assessment of Income Distribution,' *Bulletin of Economic Research*, vol. 44, no. 2, pp. 77-124.

de Villarreal, N. S. and Breach, R. S. (1988) 'Evaluation of the impact of Minimum Wages on the Mexican Economy,' In *Assessing the Impact of Statutory Minimum Wages in Developing Countries: Four Country Studies*, International Labour Organization, ILO, Geneva.

Drobny, A. and Wells, J. (1983) 'Wages, Minimum Wages, and Income Distribution in Brazil,' *Journal of Development Economics*, vol. 13, (..), pp. 305-330.

Fiszbein, A. (1992) 'Do Workers in the Informal Sector Benefit from Cuts in the Minimum Wage?' World Bank Policy Research Working Paper No. 826.

Freeman, R. B. (1996) 'The Minimum Wage as a Redistributive Tool,' *The Economic Journal,* vol. 106, no. 436, pp. 639-649.

Machin, S. and Manning, A. (1996) 'The Effects of Minimum Wages on Wage Dispersion and Employment,' *Industrial and Labor Relations Review,* vol. 47, no. 2, pp. 319-29.

Dickens, R., S. Machin and A. Manning. (1999) 'The Effects of Minimum Wages on Employment: Theory and Evidence from Britain,' *Journal of Labor Economics,* vol. 17, no. 1, pp.1-22.

Katz, L. and A. Krueger (1992) 'The Effect of the Minimum Wage on the Fast Food Industry,' *Industrial and Labor Relations Review,* vol. 46(October), pp. 6-21.

South African Team for Employment Promotion, (SATEP)-ILO (1988) 'Minimum Wage Fixing in Botswana: Implications for Employment and Income Distribution,' In *Assessing the Impact of Statutory Minimum Wages in Developing Countries: Four Country Studies*, Geneva: International Labour Organization.

Rebitzer, J. and Taylor, L. (1995) 'The Consequences of Minimum Wage Laws Some: New Theoretical Ideas,' *Journal of Public Economics*, vol. 56, pp. 245-555.

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