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Trade Liberalization and the Self-employed in Mexico

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Abstract

In this paper I examine the trend in income inequality and poverty among the self-employed workers in Mexico over the last two decades (1984–2002). This is the period over which Mexico opened its economy to the global market through trade and investment liberalization. For the first decade following the liberalization, inequality and poverty among the self-employed increased; as the economy stabilized and the country saw economic growth inequality started to go down, but poverty kept increasing. To understand the changes in inequality and poverty I decompose the inequality and poverty indices into within and between group components. Rising returns to skilled labour, regional differences in impact of liberalization and sectoral shifts in employment are important factors in explaining the trends in both inequality and poverty.

Keywords: income inequality, poverty, Shapley–Shorrocks decomposition, self-employed, Mexico

JEL classification: D63, I32, F14

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Tables appear at the end of this paper.

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1 Introduction

This paper examines the trend in income inequality and poverty, over the last two decades, among the self-employed workers in Mexico. The period covered by the study (1984–2002) was marked by trade and investment liberalization in Mexico.[1] While the first half of this period was plagued by deep financial crisis and slow growth in the economy, since 1996 the economy has stabilized and seen rapid growth (Lustig, 1998).

As Mexico opened its economy to the global market it was expected that its abundant unskilled labour would benefit. Two decades on, the result of this globalization has been an increase in the relative demand of, and the relative returns to, the skilled labour, leading to an overall increase in inequality in the country. Though much work has been done on documenting and understanding the rise in inequality for the wage earners[2], not much has been said about the income inequality among the self-employed.

According to the World Bank: 'In 2002, half the population in Mexico was living in poverty and one fifth was living in extreme poverty.'[3] Literature on Mexico has so far mainly focused on the distribution of income, largely ignoring the poverty analysis[4]; poverty among the self-employed has been, up till now, an unexplored area.

Why the self-employed? Self-employed form 28 per cent of the labour force in Mexico[5], and are almost entirely in the informal sector of the economy. They often do not have access to unions, are not covered by

[1] Mexico signed GATT (The General Agreement on Tariffs and Trade) in 1986 and NAFTA (The North American Free Trade Agreement) in 1994.

[2] Cragg and Epelbaum, 1996; Feenstra and Hanson, 1997; Hanson and Harrison, 1999; Hanson, 2003; Legovini *et al.*, 2005.

[3] Source: World Bank website: Poverty in Mexico - Fact Sheet (accessed: 10/11/2006).

[4] See papers by Szekely (1995, 2003) and Garza-Rodriguez (2002) for some recent work on poverty in Mexico.

[5] This is much higher than the average of 10% in UK and US (Blanchflower, 2002).

the minimum wage legislations, and do not have access to social security networks like health care, retirement benefits, life and disability insurances (Samaniego, 1998).

As liberalization opens the economy and firms are subject to competition, theory suggests that the informal sector will increase as workers in the formal sector are laid off to reduce the labour costs and increase efficiency (Goldberg and Pavcnick, 2003; Marjit and Maiti, 2005). This gives rise to the fear of 'social exclusion' of the self-employed, as they may not be able to benefit from the gains of trade which are restricted to the formal sector of the economy (Carr and Chen, 2004; Jhabvala and Kanbur, 2002).

Self-employment is often viewed as a way out of poverty, unemployment and disadvantageous situations, like discrimination faced by the minorities in the labour market (Light, 1972; Sowell, 1981; and Moore, 1983). In developing countries, where the social income support mechanisms do not exist, households absorb negative income shocks, due to economic downturns, by turning to self-employment. Flexible working hours in self-employment also means that women are able to reconcile their decision to enter the labour force with their 'caregiver' role in the household (Cunningham, 2001).

By ignoring this group we are not only ignoring one third of the labour force, but also the most vulnerable section of the economy.[6] I start the analysis by looking in detail at who the self-employed are in Mexico, how their characteristics have changed over the last two decades and what the trend in overall inequality and poverty among them has been.

To understand the nature of, and changes in, inequality and poverty among the self-employed, section 3 presents some potential explanations. These hypotheses are then tested by decomposing the inequality and poverty indices by population subgroups and changes over time. The population subgroup partitions are done based on region of employment, sector of em-

[6]For e.g. the poverty rates among the wage earners in Mexico are only a fraction of what they are among the self-employed. More on this in section 3 of the paper.

ployment, education and gender of the workers; each subgroup partition is chosen in a way to highlight the potential impact of liberalization. The last section presents some concluding discussion.

2 Data and descriptive statistics

The data used for this study is from *Encuesta National de Ingresos y Gastos de los Hogares* (ENIGH). ENIGH is the national household survey, which started in 1984, continued in 1989, 1992 and every two years thereafter. In this paper focus is on three years: 1984, 1994, and 2002.

To look at the period before the trade and financial liberalization I analyze the data for 1984. Since the majority of reforms were implemented by 1994, comparison of 1984 and 1994 gives the potential impact of trade reforms. Comparison of 1994 and 2002 shows how the stabilization and recovery of the economy affected the self-employed.

Sample selection criterion: The sample selected for this study is of those who report self-employment as their only source of income.[7] Individuals who report income from both wage labour and self-employment are excluded, as it is not possible to distinguish how many hours a week are spent on each activity. Unpaid family workers are also excluded from the sample. All those who report zero income are deleted from the sample, as log of income is used in the inequality measures and their decomposition. The sample is further limited to those above 16 years of age. Unit of analysis is real monthly income in new pesos, obtained by deflating the nominal income by the consumer price index (obtained from Banco de Mexico), with 2002 as the base year. Sample weights are used throughout to account for

[7] Self-employed are defined as those who identify themselves as: own account workers; patron, employer or proprietor of a business with 1 to 5 workers; and patron, employer or proprietor of a business with 6 or more workers. In all years the majority of self-employed workers (86% and above) fall in the category of 'own account workers'. 'Patron, employer or proprietor of a business with 6 or more workers' are less than 1.5 % of the self-employed.

the complex survey design used by ENIGH.

2.1 Who are the self-employed?

A number of studies look at the relationship between business cycles (particularly the unemployment rate) and self-employment rate, there doesn't however seem to be a consensus on the direction of this relationship. 'It does seem then that there is some disagreement in the literature on whether higher unemployment acts to discourage self-employment because of the lack of available opportunities or encourage it because of the lack of viable alternatives.' (Blanchflower 2000: 477.)

Table 1 reports rates of self-employment and unemployment in Mexico for the last two decades. The rates of self-employment have not changed significantly over time; in 1984 about 29 per cent of the employed were working for themselves, this number decreased to 27 per cent by 2002. In the case of Mexico, the changing macro environment, either in terms of unemployment rates or policy changes due to liberalization, seems to have no impact on the proportion of self-employed workers in the economy.[8]

Table 2 reports the average characteristics of the self-employed. Relevant figures for wage earners are in Appendix Table A1. The self-employed tend to be older, have a lower education level, higher proportions of them are married and are heads of their household. The average age of the self-employed is 44 years, which, on an average, is ten years older than the wage earners.

There were significant gains in education in Mexico between 1984 and 1994, at the national level the average years of education increased from 5.6

[8] Goldberg and Pavcnik (2003) and Marjit and Maiti (2005) suggest an ambiguous relationship between trade policy and the size of the informal sector. In their empirical work Goldberg and Pavcnick (2003) find no relationship between trade policy and informality in Brazil, but a positive relationship for Colombia. However, self-employed are a fraction of the informal sector, even if the size of the informal sector is unchanged with the change in trade policy, it does not mean that size of self-employed will remain unchanged.

in 1984 to 6.9 in 1994 (Legovini et al., 2005). This is reflected in the gains made by the self-employed; in 1984 less than 10 per cent of them had more than nine years of education (secondary school and higher), by 1994 this number increased to 26 per cent, where it has stabilized since then.

The labour force participation of the women has increased over the last two decades in Mexico; the increase has been more among the self-employed than among the wage-earners. In 1984 30 per cent of the self-employed were women, by 2002 this figure increased to 44 per cent. Increased female participation may explain why the proportion of the self-employed who are heads of their household has fallen from 71 per cent in 1984 to 61 per cent by 2002 (women often tend not be the heads of their household). The number of households, to which the self-employed belong, who have young (less than 5 years old) children has declined; this once again could explain the increased female participation in the labour force.

Most of the self-employed are concentrated in the relatively less prosperous central and the southern states of the country. The majority of the self-employed are concentrated in the tertiary sector (where most of them work as vendors, sellers, or shopkeepers) followed by the agricultural sector (where almost all of them are agricultural workers), with the share of the former increasing and the later decreasing over time.

Average weekly hours worked by the self-employed are 41 hours, which is about 3 hours less than the average hours worked per week by the wage earners. The standard deviation of weekly hours, however, is higher for the self-employed compared to the wage earners, indicating the more flexible hours worked by the self-employed.

I also estimate a simple probit model, with the dependent variable taking value 1 if the individual is self employed and 0 if wage earner. Results are reported in Table 3, they support the evidence from the average characteristics. The probability of being self-employed: increases with age; it

is higher for individuals who are married, are head of their households, for women and for unskilled workers; it increases if there are children in the household below the age of 5, and if there are other self-employed members in the household.

3 Inequality and Poverty

Mean real log income for the self-employed remained stable till 1994, after which it declined (see Table 2), the biggest decline in real earnings came after the 1995 peso crisis. Inequality (as measured by standard deviation of log income), followed a different time path: increasing till 1994 after which it declined. The period of liberalization (1984–1994) is thus associated with a period of rising inequality.

The poverty line used in this analysis is from the Ministry of Social Development in Mexico (SEDESOL), it is defined as the monthly per capita income needed to fulfill nourishment necessities; in 2002 pesos the values for the rural and the urban poverty lines are 494.77 and 672.25, respectively.[9] The poverty headcount ratio (share of the population which is poor) and the poverty gap (representing the average shortfall of income for the poor) are reported in Table 2. Poverty headcount in Mexico doubled over the period covered here, it went up from about 21 per cent in 1984 to 40 per cent in 2002; most of this increase happened after the 1995 peso crisis, the headcount ratio for 1996 was 33 per cent.

Poverty and inequality among the wage earners is reported in Appendix Table A1. The trends in inequality among the wage earners are very similar to those of the self-employed; poverty rates among them, however, are very low in comparison to those among the self-employed. Also, unlike for the self-employed, the poverty rates among the wage earners over the period of

[9] Definition and construction of poverty line is not unique. For a general discussion of different poverty lines used in literature see Deaton (1997: Chapter 3). See De Hoyos (2005) for details on the different poverty lines calculated by SEDESOL, for Mexico.

trade liberalization actually declined and started to increase only after 1994.

3.1 Potential explanations

To understand the nature of changes in inequality and poverty in Mexico, I do subgroup decomposition of the inequality and poverty indices. The subgroups considered here are by education level of the worker, region of employment, sector of employment, and by gender. Access to health, education and other institutions differ significantly across sector of employment, location and gender, hence these distinctions are important for policy analysis.

Education: There is a consensus in the literature that in Mexico trade liberalization led to an increase in relative demand and hence the relative returns to skilled labour, which in turn led to an overall increase in inequality among the wage earners.[10] This could also explain the rising income inequality among the self-employed over 1984 to 1994. As the demand for the skilled labour increased so did its supply, this opposing force should have some equalizing effect on the distribution of earnings. It however takes time for the 'educated cohorts to enter the labour force' (Legovini et al., 2005). The decrease in inequality since 1994, could thus be explained by the increase in the supply of skilled labour, catching up to the demand.

Education is a negative correlate of poverty (Garza-Rodriguez, 2002). Increase in education levels should have a negative impact on the poverty rates, but the relatively decreasing returns to the low skilled, which the majority of the self-employed are, is likely to increase their probability of falling into poverty.

The first subgroup partition attempts to capture the effect of increased returns to skilled labour and the increased levels of education among the

[10] Cragg and Epelbaum, 1996; Hanson and Harrison, 1999.

self-employed. The sample is partitioned into two groups: unskilled and skilled workers. The unskilled workers are defined as having less than nine years of schooling; the skilled workers are defined as those who have nine or more years of education (i.e. have completed the secondary school at the least).

Region: There are significant regional differences in the impact of trade liberalization in Mexico (Hanson, 1997; Feenstra and Hanson, 1997). Wage gains were larger in the regions exposed to international trade, foreign direct investment (FDI), and the opportunity to migrate to the US (Hanson, 2003). Before the trade barriers went down and FDI flowed into the country (i.e. pre 1985) economic activity was concentrated in and around Mexico City which is the largest market in the country. With trade liberalization the large market of the US and the large share of US in Mexico's trade meant that closeness to US became more important. Most of the FDI came to *maquiladoras*[11], which were concentrated in the border states. After NAFTA in 1994, FDI started to shift south and central states benefited, while the southern states still lagged behind (Sanchez-Reaza and Rodriguez-Pose, 2002).

There are significant regional variations in poverty as well in Mexico. The northern states, which have largely benefited from liberalization, have historically had lower poverty rates when compared with the southern, agricultural and rural states (Hanson, 2005).

The second subgroup partition attempts to capture the regional effects on inequality and poverty. The sample is divided into five regions: the border states (these are states which border the US), the northern states, the central states, the capital region, and the southern states (for details refer to the notes of Table 2).

Sector: While there is no debate that the demand for skilled labour

[11] *Maquiladoras* are export processing plants in Mexico, mainly located on the US-Mexico border.

increased in Mexico following the trade liberalization, the cause of this increase in demand is hotly debated. One argument relies on between industry changes: liberalization led to an increase in relative prices of skill-intensive goods, benefiting the industries that employed skilled labour, as these industries expanded so did the demand for skilled labour (Revenga, 1997; Hanson and Harrison, 1999; Feliciano, 2001). The second argument relies on within industry changes: liberalization brought in skill biased technological changes that resulted in increased demand for skilled labour within each industry (Cragg and Epelbaum, 1996; Feenstra and Hanson, 1997). Robertson (2000) finds evidence in support of both arguments.

The third subgroup partition attempts to capture these within and between group changes across sectors of employment. The sample is divided into three sectors, primary sector (agriculture), secondary sector (mineral extraction, electricity, manufacturing and construction) and tertiary (trade, transport, service related) sector. The tertiary (primary) sector has the highest (lowest) proportion of skilled self-employed workers.

Gender: Effects of free trade on women are not clear. Among the positive impacts envisaged are: increased competition, which means less employer discrimination; and feminization of high paid jobs, particularly in the industrial sector (Fontana et al., 1998; Artecona and Cunningham, 2002). The potential negative impacts of free trade include: 'masculinization' of typical female jobs, as seen in maquiladoras in Mexico (Fleck, 2001); and a decrease in prices of commodities produced by women, particularly in the agricultural sector (Fontana et al., 1998).

Women in general receive low wages, as the female labour force participation increases the lower tail of the income distribution gets pulled further down, potentially increasing both inequality and rates of poverty among them. How this will work out in an environment of trade liberalization is hard to conjecture. To shed some light on this issue, the final subgroup

partition in this paper is based on gender.

3.2 Methodology

3.2.1 Inequality

In this paper two measures of inequality belonging to the generalized entropy index family are used

$$E_0 = \frac{1}{n}\sum_i \log\left(\frac{\mu}{y_i}\right) \tag{1}$$

$$E_2 = \frac{1}{2n}\sum_i \left[\left(\frac{\mu}{y_i}\right)^2 - 1\right] \tag{2}$$

where n is the size of the population, μ is the population mean income, and y_i is the income of individual i. E_0 is the mean logarithmic deviation (MLD) and E_2 is the transformed (half of the) coefficient of variation. E_0 (E_2) is more sensitive to changes at the bottom (top) of the income distribution.

The population can be divided into K different, mutually exclusive, subgroups, with n_k members in each group. The Shapley-Shorrocks decomposition (Shorrocks, 1999) for each of the inequality measure, into within and between groups inequality, is given as

$$E_0 = \sum_k \nu_k E_{0k} + \sum_k \nu_k \log\left(\frac{1}{b_k}\right) \tag{3}$$

$$\begin{aligned} E_2 = {} & \frac{1}{2}\left[\sum_k \nu_k b_k^2 E_{2k} + \sum_k \nu_k E_{2k}\right] \\ & + \frac{1}{2}\left[\sum_k \nu_k (b_k^2 - 1) + \sum_k \nu_k (b_k^2 - 1) E_{2k}\right] \end{aligned} \tag{4}$$

where $\nu_k \equiv n_k/n$ is the population share of group k, E_{0k} and E_{2k} are the measures of inequality within subgroup k, and $b_k \equiv \mu_k/\mu$ is group k's mean

income relative to the population mean income.

The first term in both decompositions is the within group inequality and the second term is the between group inequality. Within group inequality is interpreted as the amount by which inequality will fall if income were redistributed equally within each group, holding the between group inequality constant. Similarly the between group inequality is interpreted as the amount by which inequality will fall if mean of each group is same ($b_k = 1$, $\forall\ k$), i.e. there is no difference in mean income between groups. Between group inequality is also called the pure 'education' effect or the pure 'regional' effect, depending on the subgroup partition under consideration.

There are two main benefits of using the Shapely-Shorrocks decomposition. First, the decomposition is exact. Second, the decomposition is not path dependent, i.e. it does not matter whether we first eliminate between group inequality and look at the within group inequality, or if we first eliminate within group inequality and measure the extent of between group inequality.

The change in E_0 over time can be written as (Mookerjee and Shorrocks, 1982)

$$\Delta E_0 \simeq \underbrace{\sum_k \overline{\nu}_k \Delta E_{0k}}_{[term\ A]} + \underbrace{\sum_k \overline{E}_{0k} \Delta \nu_k}_{[term\ B]} + \underbrace{\sum_k \left(\overline{b}_k - \overline{\log b_k}\right) \Delta \nu_k}_{[term\ C]} + \underbrace{\sum_k \left(\overline{\theta}_k - \overline{\nu}_k\right) \Delta \log\left(\mu_k\right)}_{[term\ D]} \tag{5}$$

where $\theta_k \equiv \nu_k b_k$, Δ is the difference operator (e.g. $\Delta E_0 = E_0(t+1) - E_0(t)$) and a bar over the variable indicates average over the two periods (e.g. $\overline{\nu}_k = \frac{1}{2}[\nu(t+1) + \nu(t)]$). Term A represents the pure inequality change, this is the impact of changes in the within group inequality; term B and C represent effect on within group and between group inequality, respectively, due to changes in the numbers in different groups; and term D is the contribution of changes in the relative incomes of different groups on

the change in inequality.

3.2.2 Poverty

For poverty I use the indices given by Foster, Greer, and Thorbecke (1984), often referred to in the literature as the FGT poverty measures. The general formula for the FGT measures is

$$P_\alpha = \frac{1}{n}\sum_{i=1}^{q}\left[\frac{z - y_i}{z}\right]^\alpha \tag{6}$$

where z is the specified poverty line and q is the number of poor ($y_i < z$) individuals in the population. α is a parameter which can take different values, $\alpha = 0$ gives us the headcount measure. When $\alpha = 1$ we get Poverty Gap, this gives us the 'depth of poverty', it shows the amount of resources needed to lift all the poor in the population out of poverty.

Like the inequality indices the FGT class of poverty measures can also be decomposed for the population subgroups. Poverty measure for the whole population is simply the weighted sum of the poverty measure for the population subgroup, given by

$$P_\alpha = \sum_k \nu_k P_{\alpha k} \tag{7}$$

where $P_{\alpha k}$ is the measure of poverty within subgroup k.

The change in poverty over time can be decomposed as (Ravallion and Huppi, 1991)

$$\Delta P_\alpha = \underbrace{\sum_k \nu_k(t)\Delta P_{\alpha k}}_{[term\ I]} + \underbrace{\sum_k P_{\alpha k}(t)\Delta\nu_k}_{[term\ II]} + \underbrace{\sum_k \Delta P_{\alpha k}\Delta\nu_k}_{[term\ III]} \tag{8}$$

Term I is the within group effect, which gives us the contribution of changes in poverty within each group to the aggregate change in poverty. Term II is the between group effect, this gives the contribution of population shifts

to the aggregate poverty. Term III is the interaction effect, this reflects the changes in aggregate poverty due to any interaction between the within and between group effects.

4 Empirical evidence

4.1 Inequality

Table 4 presents the aggregate inequality as measured by E_0 and E_2 for three years: 1984, 1994, and 2002. There was an increase in inequality between 1984 and 1994, E_0 increased by about 39 per cent and E_2 increased by 234 per cent; from 1994 to 2002 inequality declined by 12 per cent and 74 per cent for E_0 and E_2, respectively.

The aggregate inequality is decomposed into the within group and the between group components, using equations (3) and (4) for E_0 and E_2 respectively. For all subgroups, in all three years, within group inequality is more important than the between group inequality, both in absolute value and as a proportion of the aggregate inequality.[12] Over the period of rising inequality the share of between group inequality in aggregate inequality increased for all subgroup partitions, indicating some degree of polarization. These results are robust to the measure of inequality used.

Within group inequalities (Table 5): (i) Skilled workers earn more than the unskilled workers, however inequality within them is lower than the inequality within unskilled workers. (ii) Central states, where the self-employed are concentrated, had the lowest mean income and the highest inequality in 1984. This changed over time, as the southern states started accounting for greater proportions of the self-employed, the average income in south fell, and the within group inequality increased. (iii) In 1984 inequality within different sectors accounted for almost all the aggregate inequality.

[12] High within group inequality is not surprising as the self-employed tend to be a heterogenous group of workers.

This changed by 1994, since then between group inequality has increased. (iv) Men have higher education levels, earn more, and have lower within inequality.

Change in inequality over time: To understand how much did each component (within group and between group) contribute to the change in inequality, Table 6 reports the decomposition over time, based on equation (5).

Education: Changes in the within group inequality account for a bigger share of the changing inequality for the period of rising inequality; for the period of falling inequality it is the fall in the between group inequality that is more important. Most of the increase in within group inequality in the first period comes from an increase in within group inequality among the unskilled workers (Table 5); however for the decrease in inequality it is the falling within group inequality for the skilled labour which is more important. The increase in the share of skilled workers over time has reduced the within group inequality (term B), however it increased the between group inequality (term C).[13]

Region: If there were no regional differences in the impact of trade liberalization, inequality over the period 1984 to 1994, would have been 23 per cent less; about 6 per cent of the decline in inequality, from 1994 to 2002, is also explained by the falling gap in mean incomes across regions (term D). Within group inequality still remains the biggest component of both the fall and the rise in inequality.

Sector: Changing shares of population in the different sectors, predominantly people moving out of agriculture, has an equalizing effect both for the periods of rising and declining inequality. For the period of liberalization

[13]Between 1984 and 1994 the ratio of average monthly income of the skilled and the unskilled self-employed workers increased from 2.15 to 3.40, this was a result of a combination of decreasing average monthly income for the unskilled workers and an increase in average hourly income for the skilled workers. The ratio declined from 3.40 to 2.30 over 1994 to 2002.

both the within and between inequality are important. For the period of falling inequality most of the decline comes from changes in the within group inequality, with between group inequality declining only marginally. Most of the increase (decrease) in within group inequality in the first (second) period comes from increase (decrease) in the within group inequality in the primary sector.

Gender: Almost all the increase (decrease) in inequality can be explained by the increase (decrease) in the within group inequality. Changes in the mean income across groups and increased female labour force participation do not have a big impact on the changes in inequality. The increase in within group inequality in the first period comes from an increase in within group inequality both for men and women, however the decline in the within group inequality in the second period comes largely because of a decline in the within group inequality for women.

4.2 Poverty

Over the period of two decades poverty in Mexico increased. In the first period of adjustment and rising inequality (1984–1994) incidence of poverty increased by about 17 per cent; after that though the inequality started to decrease (1994–2002) the incidence of poverty increased by 68 per cent. After 1994 the big increase in poverty came following the 1995 peso crisis, incidence of poverty increased by about 38 per cent from 1994 to 1996.

The subgroup decomposition of the poverty (Table 7) gives us an idea about the most vulnerable groups in the country. Unskilled workers, workers in the primary sector, and women have the highest poverty rates. There are significant regional differences in poverty as well. Before the liberalization process took off (i.e. in 1984) the central states had the highest poverty rates. By 2002, the south had the highest incidence of poverty.

Changes in poverty over time (Table 8):

Between group effect (population shifts, term II): the change in the population shares of different groups in most of the cases contributed to a decline in poverty. This is not surprising, the skilled workers have lower incidence of poverty, as their share increased in population it had an effect of downward pressure on poverty headcount. Similarly the decline in the share of primary sector workers had a downward pressure on poverty. Over time the participation of women in labour force increased, this had the effect of increasing poverty, as incidence of poverty among women is higher. Also, as the share of the population in southern states increased, it put an upward pressure on poverty, in the second period (1994–2002).

Within group effect (term I): Increase in poverty over time in case of all subgroups was predominantly a result of increase in the within group effect i.e. an increase in poverty within the different subgroups.

Looking at the change in poverty within each subgroup (Table 9): (i) The increased poverty among the unskilled workers was the main factor in the increase in aggregate poverty. (ii) For the first period (1984–1994) the increase in poverty in the southern states was the biggest contributor to the aggregate poverty; the capital region saw a decline in poverty and had a negative contribution to the aggregate poverty. (iii) 1984 to 1994 the increase in aggregate poverty came from an increase in poverty among the primary sector workers. As the share of the self-employed in the primary sector decreased and that in the tertiary sector increased poverty in the tertiary sector became important. (iv) Though the poverty rates among men are lower, they had a larger contribution to the aggregate poverty increase.

5 Concluding discussion

Liberalization policies followed in Mexico over the last two decades have had a strong distributional effect in the country. For the first decade following

liberalization inequality and poverty among the self-employed in the country increased; as the economy stabilized and the country saw economic growth inequality started to go down, but poverty kept increasing.[14] Most of the literature on inequality and poverty in Mexico has so far focused on the wage earners, largely ignoring the self-employed workers in the country. This paper has made an attempt to plug that gap. It is important to look at the self-employed not only because they are one-third of the labour force, but also because they are one of the vulnerable groups in the economy – a group which the globalization process at best may not benefit and at worst hurt.

The objective behind this paper was to account for the trends in inequality and poverty amongst the self-employed in Mexico, during the period when major structural reforms were carried out, all of which were aimed at integrating the Mexican economy more closely with the rest of the world. To understand the trend in inequality and poverty I decomposed the inequality and poverty indices into within and between group effects.

For Mexico, the factors which have already been established in the literature as causing increase in overall inequality, and which are directly related to the liberalization process are: (1) increased relative demand for and returns to skilled labour (Cragg and Epelbaum, 1997; Hanson and Harrison, 1999); (2) significant regional differences (Hanson, 1997 and 2003); and (3) changes in the inter and intra industry demand for skilled labour (Robertson, 2000). Implications of these three impacts of liberalization are: (i) unskilled labour, in general, and the sectors with concentration of unskilled labour (for Mexico this would be the primary sector), in particular, both loose out; and (ii) regions which do not benefit from the liberalization loose out (for Mexico these would be the central and the southern states).

Given that self-employed are largely unskilled, are concentrated in the

[14] This is not surprising as the real wages over time have fallen, shifting the entire distribution of income to the left.

southern and the central states, and a large proportion of them work in the primary sector, it is not unexpected that inequality and poverty among them increased over time and that this increase, at least in part, is a direct result of the liberalization process. Evidence found in this paper lends support to this claim.

While within group inequality, for both the education and regional decompositions, is the biggest contributor to the increase in inequality, there is evidence of increase in between group inequality as well.

Increasing relative demand for and returns to skilled labour, has contributed to an increased gap between the income of the skilled and unskilled self-employed workers, leading to higher inequality. As the supply of skilled labour increased inequality started to go down, this is reflected in the narrowing of the gap between the mean incomes of the skilled and the unskilled self-employed workers. But as the self-employed are largely unskilled, the group which lost out the most as a result of liberalization, relative lower returns to them meant continued increase in poverty. Poverty among the unskilled self-employed is the biggest contributor to the aggregate poverty among them, and increase in poverty among them continued to be the major contributor to the increase in aggregate poverty.

Because of the significant regional differences in the impact of the liberalization process we also see increased gap between incomes across different regional subgroups. The central and southern states, where the self-employed are concentrated, are lagging behind and are the biggest contributors to the aggregate inequality and poverty. If the regional differences in the impact of trade liberalization did not exist both inequality and poverty would have been much lower. As the FDI moves south of the border, some of the negative impact on inequality at least seems to be going down (the between group inequality has started falling).

For the decomposition based on sectors evidence indicates both the

within and between group inequality to be significant for the period of rising inequality, which means we have evidence of both inter and intra industry increase in demand for skilled labour. Increase in poverty among the self-employed in the primary sector is important in explaining the increase in poverty in the first period. As the share of the self-employed in the tertiary sector increased, increase in poverty in the tertiary sector became important. Declining shares of the self-employed in the primary sector (sector with the highest within group inequality and poverty) has helped reduce both inequality and poverty.

Establishing any causality between liberalization process and inequality and poverty is not easy. However, '... even the most optimistic estimates cannot dismiss concerns that the globalization process, as it has proceeded to date, may have had some adverse effects on poverty and income distribution.' (Nissanke and Thorbecke, 2007.)

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Table 1: Self-employment and unemployment rates for Mexico

	Self employment rate[1]	Unemployment rate[2]	Urban unemployment rate[3]
1984	29.08	3.48	
1989	25.05	2.39	3.0
1992	26.66	3.34	2.8
1994	27.19	3.59	3.6
1996	27.15	4.14	5.5
1998	27.54	2.33	4.1
2000	26.16	2.05	2.2
2002	26.95	2.78	2.7

Note: [1] Self-employment as a percentage of total employment, ages 16 and over; sample weights were used in the calculation. These calculations are done before the sample selection criterion is applied to the data.

Source: Author's calculations from the ENIGH dataset for various years.

Note: [2] Unemployment rate is defined as the ratio of the openly unemployed (who are actively looking for work) to the economically active population, ages 16 and over; sample weights were used in the calculation.

Source: Author's calculations from the ENIGH dataset for various years.

Note: [3] Open unemployment rate in the urban areas.

Source: Banco de Mexico.

Table 2: Average sample characteristics of the self-employed[1]

	1984	1994	2002
Personal characteristics			
Log real income (monthly)	7.36 (1.33)	7.30 (1.66)	6.69 (1.54)
Age (in years)	45.57 15.34)	43.47 14.86)	46.27 15.27)
Male (1=yes)	0.70 (0.46)	0.63 (0.48)	0.56 (0.50)
Married (1=yes)	0.73 (0.45)	0.73 (0.44)	0.76 (0.43)
Education[2]	0.09 (0.29)	0.26 (0.44)	0.27 (0.44)
Hours worked per week	40.97 (19.51)	42.05 (22.2)	37.71 (21.02)
Household characteristics			
Head of the household (1=yes)	0.71 (0.45)	0.62 (0.48)	0.61 (0.49)
Children aged less than or equal to 5 years (1=yes)	0.44 (0.50)	0.43 (0.49)	0.35 (0.48)
Other self-employed members in the household (1=yes)	0.19 (0.39)	0.29 (0.45)	0.29 (0.45)
Sector of employment[3]			
Primary	0.43 (0.49)	0.32 (0.47)	0.29 (0.46)
Secondary	0.10 (0.3)	0.07 (0.26)	0.18 (0.39)
Tertiary	0.47 (0.5)	0.61 (0.49)	0.52 (0.5)
Region[4]			
Border	0.19 (0.39)	0.13 (0.34)	0.11 (0.32)
North	0.06 (0.24)	0.10 (0.30)	0.09 (0.29)
Centre	0.40 (0.49)	0.37 (0.48)	0.31 (0.46)
Capital	0.21 (0.41)	0.20 (0.40)	0.20 (0.40)
South	0.14 (0.34)	0.19 (0.39)	0.28 (0.41)
Poverty Index[5]			
Headcount (%)	20.48	23.88	40.15
Poverty gap (%)	10.00	14.94	23.21
Observations	1713	3499	4865

Notes: [1] Standard deviation in parentheses; sample weights are used in all calculations.

[2] Dummy variable, takes value 1 if the individual has 9 or more years of schooling, i.e. has secondary or higher education.

[3] Primary: Agriculture; Secondary: Mineral extraction, Electricity, Manufacturing and Construction; Tertiary: Trade, Transport, Service related industries.

[4] 32 states of Mexico are divided into five regions. Border: Baja California, Chihuahna, Coahuila, Nuevo Leon, Sonora, Tamaulipas; North: Aquascalientes, Baja California Sur, Durango, Nayarit, San Luis Potosi, Sinaloa, Zacates; Centre: Colima, Guanajuato, Hidalgo, Jalisco, Michoacan, Morelos, Puebla, Querentaro, Tlaxcala, Veracruz; Capital: Federal district, Mexico; South: Campeche, Chiapas, Guerrero, Quintana Roo, Oaxaca, Tabasco, Yucatan.

[5] Separate poverty lines have been used for the rural and the urban areas. The poverty line per capita, per month, in 2002 new pesos for the rural areas is 495.77, for the urban areas it is 672.25. (Source of the poverty lines: SEDESOL)

Source: Author's calculations from ENIGH dataset for various years.

Table 3: Probit estimates, dependent variable is 1 if self employed and 0 if wage earner

Explanatory variables	Estimated coefficients		
	1984	1994	2002
Age	0.04	0.04	0.02
Age squared	0.00[NS]	0.00[*]	0.00[NS]
Education[2]	-0.58	-0.31	-0.34
Male (1=yes)	-0.32	-0.30	-0.53
Married (1=yes)	0.35	0.37	0.32
Head of the household (1=yes)	0.17[*]	0.24	0.38
Children aged less than or equal to 5 years (1=yes)	0.02[NS]	0.00[NS]	0.05[NS]
Other self-employed members in the household (1=yes)	2.35	1.76	1.74
Sector of employment[2] (base=primary)			
Secondary	-1.13	-1.15	-0.57
Tertiary	-0.47	-0.30	-0.40
Region[2] (base=South)			
Border	-0.27	-0.10[NS]	-0.38
North	-0.46	-0.03[NS]	-0.18
Centre	-0.29	0.10[NS]	-0.32
Capital	-0.40	-0.01[NS]	-0.30
Constant	-1.29	-1.84	-1.24
Number of obs	5921	14794	21060
Pseudo R2	0.31	0.29	0.28

Notes: [NS] not significant, * significant at 5 per cent level. All other estimated coefficients are significant at 1 per cent level.

[2] For definitions see notes at the end of Table 2.

Source: Author's calculations from ENIGH dataset for various years.

Table 4: Within group and between group income inequality[1]

Subgroup partition		E_0 Aggregate inequality	E_0 Within group inequality	E_0 Between group inequality	E_2 Aggregate inequality	E_2 Within group inequality	E_2 Between group inequality
Education	1984	0.74	0.71	0.03	1.26	1.19	0.08
	1994	1.03	0.86	0.17	4.21	2.76	1.46
	2002	0.91	0.83	0.08	1.10	1.00	0.10
Region	1984	0.74	0.71	0.03	1.26	1.22	0.05
	1994	1.03	0.93	0.09	4.21	3.42	0.80
	2002	0.91	0.81	0.10	1.10	1.12	-0.02
Sector	1984	0.74	0.74	0.00	1.26	1.27	-0.01
	1994	1.03	0.87	0.16	4.21	3.47	0.74
	2002	0.91	0.77	0.14	1.10	1.45	-0.35
Gender	1984	0.74	0.64	0.10	1.26	1.14	0.13
	1994	1.03	0.92	0.11	4.21	3.61	0.60
	2002	0.91	0.81	0.10	1.10	0.98	0.12

Notes: [1] Estimates based on equations (3) and (4).

Source: Author's calculations from ENIGH dataset for various years.

Table 5: Within group inequality

	E_{0k}			$\bar{v}_k \Delta E_{0k}$	
	1984	1994	2002	1984–1994	1994–2002
Education					
Skilled	0.60	0.73	0.61	0.02	-0.03
Unskilled	0.72	0.90	0.91	0.15	0.00
Region					
Border	0.78	0.88	0.59	0.02	-0.03
North	0.56	1.00	0.81	0.04	-0.02
Centre	0.83	1.00	0.88	0.07	-0.04
Capital	0.58	0.67	0.59	0.02	-0.02
South	0.53	1.08	0.96	0.09	-0.03
Sector of employment					
Primary	0.97	1.30	1.15	0.12	-0.05
Secondary	0.64	0.44	0.62	-0.02	0.02
Tertiary	0.55	0.69	0.60	0.08	-0.05
Gender					
Male	0.62	0.84	0.77	0.14	-0.04
Female	0.69	1.05	0.85	0.12	-0.08

Source: Author's calculations from ENIGH dataset for various years.

Table 6: Subgroup decomposition of the changes in aggregate income inequality[1]

Subgroup Partition		% change in aggregate inequality (% ΔE_0)	% change in E_0 accounted for by changes in			
			Within group inequalities (term A)	Population shares (term B)	(term C)	Subgroup mean incomes (term D)
Education	1984–94	38.62	23.47	-3.41	5.92	11.64
	1994–02	-11.77	-2.69	-0.10	0.08	-9.06
Region	1984–94	38.62	30.68	-0.35	-0.13	8.94
	1994–02	-11.77	-13.67	1.26	1.31	-0.68
Sector	1984–94	38.62	24.44	-7.22	-2.48	19.38
	1994–02	-11.77	-7.25	-2.61	-1.29	-0.52
Gender	1984–94	38.62	35.78	1.30	1.94	-0.40
	1994–02	-11.77	-11.82	1.04	1.01	-1.97

Notes: [1] Estimates based on equation (5).

$$\%\Delta E_0 = \Delta E_0 / E_0(t)$$

Source: Author's calculations from ENIGH dataset for various years.

Table 7: Subgroup decomposition of poverty

Subgroup partition	Headcount, P_0 (%)		
	1984	1994	2002
Education			
Skilled	7.88	6.01	19.17
Unskilled	21.79	30.29	47.85
Region			
Border	15.08	13.32	19.31
North	16.54	23.29	35.14
Centre	25.79	29.03	43.41
Capital	19.21	7.50	18.10
South	16.42	38.87	62.00
Sector of employment			
Primary	25.33	54.72	76.05
Secondary	20.33	11.13	28.97
Tertiary	16.14	9.24	23.85
Gender			
Male	12.08	14.9	29.54
Female	40.09	39.27	53.53

Source: Author's calculations from ENIGH dataset for various years.

Table 8: Subgroup decomposition of the changes in aggregate poverty[1]

Subgroup partition		% change in aggregate poverty (% ΔP_0)	% change in poverty accounted for by changes in: Within group effect (term I)	Between group effect (term II)	Interaction effect (term III)
Education	1984–94	16.60	36.95	-11.55	-8.61
	1994–02	68.13	68.74	-1.02	-0.18
Region	1984–94	16.60	10.01	-1.89	7.41
	1994–02	68.13	57.78	5.26	4.11
Sector	1984–94	16.60	41.38	-5.55	-19.15
	1994–02	68.13	71.13	-5.23	0.03
Gender	1984–94	16.60	8.44	9.57	-1.24
	1994–02	68.13	60.72	7.14	-0.11

Notes: [1] Estimates based on equation (8).

$$\%\Delta P_0 = \Delta P_0 / P_0(t)$$

Source: Author's calculations from ENIGH dataset for various years.

Table 9: Within group changes in poverty

Subgroup partition	$v_k(t)\Delta P_{0k}$ 1984–1994	$v_k(t)\Delta P_{0k}$ 1994–2002
Education		
Skilled	-2.22	20.84
Unskilled	102.22	79.16
Region		
Border	-16.31	5.64
North	19.75	8.59
Centre	63.20	38.56
Capital	-119.93	15.36
South	153.28	31.85
Sector of employment		
Primary	149.12	40.18
Secondary	-10.86	7.35
Tertiary	-38.27	52.47
Gender		
Male	114.24	63.61
Female	-14.24	36.39

Source: Author's calculations from ENIGH dataset for various years.

Table A1: Average sample characteristics of the wage-earners[1]

	1984	1994	2002
Personal characteristics			
Log real income (monthly)	7.87 (0.82)	8.03 (0.85)	7.88 (0.85)
Age (in years)	33.17 (12.49)	32.33(12.26)	34.55 (12.68)
Male (1=yes)	0.72 (0.45)	0.69 (0.46)	0.64 (0.48)
Married (1=yes)	0.54 (0.50)	0.51 (0.50)	0.59 (0.49)
Education[2]	0.37 (0.48)	0.51 (0.50)	0.60 (0.49)
Hours worked per week	43.53 (14.36)	46.39 (14.12)	45.91 (14.15)
Household characteristics			
Head of the household (1=yes)	0.55 (0.50)	0.48 (0.50)	0.46 (0.50)
Children aged less than or equal to 5 years (1=yes)	0.51 (0.50)	0.45 (0.50)	0.38 (0.49)
Other self-employed members in the household (1=yes)	0.01 (0.09)	0.03 (0.16)	0.02 (0.15)
Sector of employment			
Primary	0.15 (0.35)	0.10 (0.30)	0.08 (0.27)
Secondary	0.32 (0.47)	0.34 (0.47)	0.31 (0.46)
Tertiary	0.53 (0.50)	0.57 (0.50)	0.61 (0.49)
Region			
Border	0.20 (0.40)	0.20 (0.40)	0.20 (0.40)
North	0.08 (0.28)	0.08 (0.28)	0.08 (0.28)
Centre	0.32 (0.47)	0.33 (0.47)	0.32 (0.47)
Capital	0.32 (0.47)	0.27 (0.44)	0.28 (0.45)
South	0.07 (0.25)	0.12 (0.32)	0.11 (0.32)
Poverty Index			
Headcount (%)	5.26	2.38	3.95
Poverty gap (%)	1.92	0.88	1.66
Observations	4208	3499	16195

Notes: [1] Standard deviation in parentheses; sample weights are used in all calculations.

[2] For definition see notes at the end of Table 2.

Source: Author's calculations from ENIGH dataset for various years.