Cátedra de Integración Económica y Desarrollo Social


Inequality reduction through self-employment under high inflation periods: the Mexican experience

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Abstract.
We propose self-employment as an explanation for the observed reduction in inequality occurring after the Mexican economic crisis of 1995. The evidence appears as a contradiction to the labour-hoarding hypothesis, which states that inequality was expected to increase because the only asset of the poor was labour. Self-employment has been an escape to inflation and staggered wages bringing as a consequence reduced inequality. Therefore, individuals will be pushed into self employment as a means of survival if they lost their jobs in the formal sector, or pulled into self employment attracted by higher potential earnings if their wages were losing purchasing power.

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JEL: D31, J24, O15.

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I. Introduction.

Even with differences in degree, equality remains an important value for most societies. As a consequence, governments with the aim of implementing public policy that will reduce inequality spend considerable efforts and resources. Mexico is one of the more unequal countries in Latin America and among middle-income economies in the World; Bouillon, Legovini, and Lustig (2003). During the last three decades of the twentieth century, the country experienced several important economic crises that had significant welfare implications for its population.

Lopez Acevedo (2004) analysed income inequality and returns to education in Mexico for the 1994-1996 period; theoretically one would expect to find increasing inequality after the 1995 crisis due to the fact that the poor are usually less skilled and their only asset is labour, and thus the first ones to get cut; whereas the wealthier have more ways to protect their assets (labour-hoarding hypothesis). However her results show a decrease in both the Gini coefficient (from 0.530 to 0.515) and the Theil index (from 0.558 to 0.524) during this period. Acevedo argues that it might be possible that the richest experienced severe capital losses due to the crisis in such a way that their total income was affected more severely compared to the poor. However, this hypothesis is not supported by the data as monetary income (other than wages and salaries), and financial income increased their share in total income during this period. Therefore, as we face a contradiction of the data with the theory, an explanation of this phenomenon is required.

Mehta and Villarreal (2005b) argue that as wages in the formal sector are fixed by contracts that cannot be instantly modified, salaries may lag behind prices, and workers might react to inflation in different ways, such as effort, hours worked, or as they propose: becoming self employed. This has a strong policy implication: adequate
social programs (that is, self-employment incentives, micro-credits, and so forth.) can be instrumental during harsh periods to mitigate welfare loses among the poor.

This paper focuses on validating, for the 1994-1996 period of the Mexican economy, the hypothesis that, under relative high inflation periods, people are more likely to turn to self-employment as a response to sticky nominal wages, allowing inflation to coexist with lower inequality and therefore explaining why the labour hoarding hypothesis does not hold. The evolution of returns to education and self-employment are analysed for the 1994-2002 period.

We inspire our model on the ones proposed by Zang (2004) and Gang, Co and Yun (2005). Under this framework behaviour is linked to the choice of being self-employed or working for a salary. The selection scheme serves two purposes, explaining who goes into self-employment and correcting possible selection biases in returns to education.

The paper is organised as follows: the next section will review the literature available on self-employment related to labour-hoarding, section 3 will develop the econometrics and assumptions of the model, section 4 shows the composition of the data that will be used to make the estimations, section 5 will analyse the results of the estimations and section 6 uses the results of the preceding section to hint some policy recommendations and briefly concludes.

II. The Labour Hoarding Hypothesis and Self-employment.

The labour hoarding hypothesis suggests that unskilled workers (among which the poor tend to be concentrated) are often the first to lose their jobs, as firms have an incentive to “hoard” their trained labour force (skilled workers) due to the existence of high costs of hiring, training and firing skilled workers. As labour tend to be poor people’s only asset and rich people have more ways to protect their financial assets (and
usually diversify risk in different ways), one would expect inequality to increase after a
recession period in the economy.

Agenor (2001) provides more arguments to why a crisis may hurt the poor most
and have an irreversible impact on their human and financial capital:

i. The poor often lack the means to protect themselves from adverse income and
employment shocks; they do not have assets (such as capital on banks or land) and
usually do not have access to credit markets to smooth the impact of economic shocks
on consumption and savings.

ii. The poor lack education and skills and therefore tend to be less mobile across
sector and regions and hence, are unable to switch jobs and go through all the available
employment opportunities compared to better educated workers.

iii. Indirect sources of income and public transfers may decline during crisis.

However Acevedo and Salinas (2000) found that after Mexico’s financial crisis
in 1994, the distribution of income and labour earnings improved and a decreased
inequality, measured by the Gini and Theil indexes, was observed. They examined the
income sources affecting the levels of inequality and concluded that the crisis had a
major impact on the richer deciles (composed mainly of skilled workers) through two
channels: it reduced their financial assets, and significantly decreased their share of
labour earnings compared to those of the poorest deciles.

Le (1999) argues that in recent years the allocation of the paid labour force
between self-employment and wage/salary earning jobs has emerged as an important
aspect of the labour market, hence, a number of countries (such as Australia and the
UK) have looked into self-employment as a possible solution to their unemployment
and poverty problems. Self-employment is a multidimensional variable, and as such,
many varying definitions exist across studies and countries. The United Nations defines
the self-employment category as the sum of employers and own account workers; an
employer is a person who operates his/her own economic enterprises or independently
engages in a profession/trade and hires one or more employees, whereas an own account
worker is defined as a person who operates his/her own economic enterprises or
independently engages in a profession/trade without hiring any employees.

Most of the studies on the literature follow the last definition, however, in this
paper we focus solely on those defined as own account workers because we want to
analyse the self-employed on a basis of skill and not as a function of wealth and capital
holdings. This exclusion is made in order to focus on a situation where workers are
more likely to face the choice between self-employment and a wage earning job
established in models of self-employment.

Mesnard and Ravallion (2005), among others, have highlighted the role of
wealth and physical capital holdings in self-employment or business start-ups, but when
employers are excluded from the equation this role doesn’t necessarily hold. In the
Mexican case, the existence of a considerable informal sector means that depending on
economic conditions, the worker will only be faced with a switching regime where
he/she will decide between working on a wage basis or working on their own. The
choice between working and not working does not exist in our case due to the lack of
subsistence means if unemployed (for example; no unemployment insurance).

Traditionally, a general reduced-form equation of self-employment choice of the
form:

\[ \text{SelfEmp} = BX_j + V_j \]  

(1)

has been widely used; in this model, the choice of self-employment is explained by a
range of variables (contained on the X vector) such as education, labour experience,
age, job stability, capital, occupational and marital status, number of children and some
psychological characteristics of the individual such as fear of failure and attitude
towards risk, and so forth. The reduced form equation is usually estimated using a
probit or logit procedure where self-employment is a binary response variable. The
main criticism of this approach is the issue arising from the simultaneous determination
of employment status and earnings (Le, 1999).

Other studies such as Rees and Shah (1986), de Wit (1993) and Bernhardt
(1994) have used a structural self-employment model to test the hypothesis that an
individual will choose self-employment if she/he perceives the earnings of that status to
be considerably greater (and enough to offset any psychological cost) than the wage
earning alternative. Therefore people under a labour contract will switch to self-
employment if:

\[ \Omega_s(k_h, k_p, X_{pc,r}) > \Omega_s(k_h, k_p, X_{pc,r}) \quad (2) \]

where the earnings of both sectors depend on human \( k_h \) and physical capital \( k_p \) and
on a vector of variables including psychological individual characteristics and attitude
towards risk \( X_{pc,r} \), among others. In this kind of model the earnings differential
between self-employment and waged/salaried employment plays an important role in
the choice made by households.

Some authors have tried to explain why people choose to become self employed
even if the expected earnings are lower compared to those of the wage earning
alternative. Hamilton (2000) argues that non pecuniary benefits to self-employment are
substantial and more than offsets the earning differentials, this is, people places high
value on the satisfaction of “being their own boss” and this is important because now
they decide directly how and when to work. Quinn (1980) suggested that workers
choose to switch to self-employment as an alternative to withdrawal from the labour
force when they are reaching their end of their working life cycle; he argues that this
choice is motivated by the greater flexibility of working hours and working conditions that make self-employment a form of partial retirement.

While the reduced form specification (1) is widely used to calculate returns to self-employment (for example; in a Mincerian framework), it is less common to control for selection into that regime by workers. On a similar setting, econometric analyses are performed on non random samples. It is important to consider both problems; if they are ignored, the wage or earnings functions estimated on selected samples will not in general accurately estimate population (that is, randomly sample) wage functions. For example, Rees and Shah (1986) and De Wit (1993) found that the selection terms for the self employed were statistically insignificant in their models. However, their estimates are consistent with negative selection which means that individuals may be forced into this sector by disadvantages in wage/salary employment or motivated by factors other than pecuniary gains as suggested by Hamilton (2000). Bernhardt (1994) concluded that the sign of the selection term was sensitive to model specification; when he estimated a model that did not control for wealth on the probit equation, such as the one performed by Borjas and Bronars (1989), he found positive and significant selection into self-employment; but, the opposite result (negative selection) was true when controlling for wealth.

III. Econometric Analysis.

The avoidance of selection decisions/processes in wage determination can produce estimation errors. In order to test (2) empirically, we propose a model inspired by Zhang (2004) and Gang, Co and Yun (2005). Based on rational choice theory, it is assumed that individuals can rank mutually exclusive alternatives in order of utility and thus face a selection problem between wage earning and self employed options; individuals will choose the alternative with the maximum expected utility given
personal tastes, preferences, and resource (land, labour or capital) constraints. This assumption can be shown with the following equations:

\[ U_{ij} = \Omega_j + \varepsilon_{ij} = \gamma_j z_i + \varepsilon_{ij} \]  \hspace{1cm} (3)

\[ Y_{ij} = \beta_j x_i + u_{ij} \]  \hspace{1cm} (4)

where

i = 1, 2, ..., N;

j = the employment choice, 1 for wage earners, 2 for self-employment;

\( U_{ij} \) = the utility individual i receives from working in alternative j;

\( z_i \) = a vector of exogenous individual characteristics affecting the employment choice;

\( \gamma_j \) = a vector of unknown utility parameters for sector j;

\( \varepsilon_{ij} \) = a disturbance term with zero population mean and constant variance;

\( Y_{ij} \) = natural logarithm of hourly wage;

\( x_i \) = a vector of exogenous individual characteristics determining the wage rate;

\( \beta_j \) = a vector of unknown sector-specific wage parameters to be estimated;

\( u_{ij} \) = a disturbance term with zero population mean and constant variance.

The two error terms \( \varepsilon_{ij} \) and \( u_{ij} \) represent the impact that unobserved variables have respectively on utilities and wages and the sampling rule implies that the earnings function \( Y_{ij} \) can only be observed if individual i chooses alternative j, \( I_i = j \).

Thus, a binary choice model can be formulated by utility maximization:

\[ \eta_{ij} = \max_{k=1,2} U_{ik} - \varepsilon_{ik} \]  \hspace{1cm} (5)

To deal with truncation, \( \eta_{ij} \) can be transformed into a standard normal random variable as follows:

\[ \eta_{ij}^* = \Phi^{-1} \left[ F \left( z_i' \gamma_j \right) \right] \]  \hspace{1cm} (6)

Where \( \Phi \) denotes the cumulative distribution function (cdf) of the standard univariate normal distribution, also, it should be noted that:

\[ \eta_{ij}^* < \Phi^{-1} \left[ F \left( z_i' \gamma_j \right) \right] \]  \hspace{1cm} (7)
Using only observations of individuals who select themselves into wage earning or self-employment, the conditional expected wage for each alternative can be derived as follows:

\[ E[y_{ij} \mid I_i = j] = x_i' \beta_j + E[u_{ij} \mid \eta_{ij}^* < \Phi^{-1}[F(z'_i, \gamma_j)]] \] (8)

And this conditional wage can be evaluated as:

\[ E[y_{ij} \mid I_i = j] = x_i' \beta_j + \sigma_j \rho_j \left[ -\frac{\varphi[\Phi^{-1}[F(z'_i, \gamma_j)]]}{F(z'_j, \gamma_j)} \right] + v_{ij} \] (9)

Where \( \varphi \) and \( \Phi \) denote the probability density function (pdf) and cumulative distributive function (cdf) of the standard univariate normal distribution respectively. \( \sigma_j \) is the variance of the error term \( \varepsilon_{ij} \), \( \rho_j \) is the correlation coefficient between \( u_{ij} \) and \( \eta_{ij}^* \), the error term \( v_{ij} \) has a zero mean and is uncorrelated to \( u_{ij} \).

Now we can estimate equation (9) using Heckman’s two step selection bias correction method; in the first stage we model the binary employment choice by way of a probit equation. The results of this estimation will then be used to construct the selection correction term (Inverse Mills Ratio) for individuals selecting into each alternative:

\[ y_{ij} = \beta_j x_i + \rho_j \sigma_j \hat{\lambda}_{ij} + v_{ij} = \beta_j x_i + \delta_j \hat{\lambda}_{ij} + v_{ij} \] (10)

The population will be divided into two samples: individuals in wage-earning employment, and individuals who are self employed. Equation (10) will then be estimated for each of those samples. Estimates of \( \delta_{self} < 0 \) and \( \delta_{wage} > 0 \) imply positive selection into each activity; the finding of positive selection bias for alternative \( j \) suggests that the wage distribution observed for individuals choosing that option is higher than would be found for comparable workers who chose the opposite alternative; the latter suggests that unmeasured characteristics (such as the desire and ability to work...
on a structured work environment and attitudes towards risk) which affect the choice of
the working activity also influence the wages related to that choice. In order to achieve
identification at least one explanatory variable of the selection equation must differ with
the wage equation.

IV. The data and empirics.

For our study we use data sourced from ENIGH (Encuesta Nacional de Ingreso y
Gasto de los Hogares) for the years 1994, 1996, 1998, 2000 and 2002. ENIGH’s are
household income-expenditure surveys that provide information of sociodemographic
and financial characteristics of Mexican households, which are collected by the INEGI
(Instituto Nacional de Geografía e Informática). From the information available we can
distinguish between employed, self employed and business owners, and also construct
the required variables for the estimation of the model specified in last section (such as
education, experience, working area, income coming from labour, income coming from
capital).

The sample is constructed in the following manner:

i. Only economically active adults between the ages of 16 and 65 are considered.

ii. People work either on agriculture or non-agriculture sectors as wage earners.

iii. People classified as self employed and not hiring any employees.  

iv. The individual must work at least five hours a week in total (between primary
    and secondary jobs), to guarantee that the individual works at least one hour per
day.  

v. Only income coming from labour and business is accounted for; we add both
    sources to get the total income for each individual.

vi. Individuals reporting themselves as belonging to categories (ii) and (iii) but not
    reporting any income from labour or business are removed from the sample.
vii. Individuals earning an hourly wage of at least two pesos.\textsuperscript{5}

Table 1 presents the mean characteristics of the full sample used for making the analysis by type of employment. All the monetary variables are adjusted through CPI to year 2000 pesos. In general, we can observe that the self employed account for less of 25\% of the population, with the proportion of males doubling that of females. The self employed have fewer years of education but more experience, work on average 4.2 hours a week less and are older than their wage-earning counterparts.

Earnings declined for both sectors following the 1994 crisis (30\% for the wage earners and 31\% for the self employed), however the self employed recovered faster than the wage earners; by 1998 they were earning 17\% more than they were in 1996 compared to the increase of just 6\% of the wage earners. For the 2000-2002 period we observe another decline in earnings for both sectors that is sharper for the self employed although the reasons for this are not very clear and remain to be explained.

Another thing that is worth noting is the low proportion of the working population belonging to a union; in the case of the self employed, none of the individuals belonged to one. This supports evidence for the existence of other forms of compensation that employees receive (health insurance and pensions for example) that are not accounted for when interpreting earning differentials.

**Table 1. Population Mean Characteristics by Type of Employment.**

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<tbody>
<tr>
<td></td>
<td>Wage</td>
<td>Self</td>
<td>Wage</td>
<td>Self</td>
<td>Wage</td>
</tr>
<tr>
<td>N</td>
<td>12197</td>
<td>3764</td>
<td>13267</td>
<td>3925</td>
<td>10201</td>
</tr>
<tr>
<td>Age</td>
<td>32.36</td>
<td>40.99</td>
<td>32.59</td>
<td>41.01</td>
<td>33.21</td>
</tr>
<tr>
<td>Education</td>
<td>8.40</td>
<td>5.45</td>
<td>8.73</td>
<td>5.72</td>
<td>8.78</td>
</tr>
<tr>
<td>Hrs work</td>
<td>47.62</td>
<td>44.87</td>
<td>47.87</td>
<td>44.16</td>
<td>47.59</td>
</tr>
<tr>
<td>Labour inc</td>
<td>14445</td>
<td>276.67</td>
<td>10126</td>
<td>396.95</td>
<td>10781</td>
</tr>
</tbody>
</table>
The next question that arises is that of which individuals choose to become self-employed over being a wage earner. To solve this question we need to examine micro data so we can determine the factors that characterize a self-employed individual. Probit equations are estimated for each year; we use the sample specified earlier on to model the probability of being self-employed as a function of age, years of education, gender, living area (rural or urban) and economic sector.

The estimated self-employment probit equation is:

\[
\text{Selfemployed} = \beta_0 + \beta_1 \text{education} + \beta_2 \text{Age} + \beta_3 \text{midlev} + \beta_4 \text{highlev} + \beta_5 \text{matag} + \beta_6 \text{midag} + \beta_7 \text{male} + \beta_8 \text{rural} + \beta_9 \text{agri} 
\]  

Equation (11) shows *self employed* as a dependent dichotomous variable that has a value of one if the individual reports him or herself as self-employed and of zero otherwise. *Education* is a continuous variable of years of schooling that accounts only for completed years of formal education. *Age* is a continuous variable of years of life. We are interested in finding out which groups are more likely to engage into self-employment, which is why we add “level” variables for age and education to fit individuals into particular groups. In the case of education, *midlev* is a dummy variable that sets to one if the individual has between 9 and 12 years of schooling and to zero if otherwise, *highlev* is a dummy variable that sets to one if the individual has more than
12 years of education and to zero otherwise (the reference variable is of those individuals with less than nine years of education). In the case of age we define midage and matage as dummy variables setting to one if the individual lies within the 31-54 range and older than 54 respectively, and to zero otherwise (the reference variable is that for individuals aged less than 31). Male is a dummy variable set to one if the individual is a male and to zero if female. Rural is a dummy variable set to one if the individual lives in a community of 2500 people or less and to zero otherwise. Agri is a dummy variable set to one if the individual works in the agricultural sector and to zero otherwise (manufacture, retail or service sectors).

The predicted value obtained by the probit estimation can be interpreted as the effect that the change of each response variable has over the probability of becoming self employed. Estimated self-employment probit results are presented in Table 2. Most of the results are statistically significant at 5% confidence levels. Estimations indicate that men have a lower probability of entering self-employment compared to women; this result is consistent across years and it was expected because women might find self-employment as a source of flexible working and hence provide income for the household, whereas males may look for more stable work that provides health care and a pension for retirement. The number of years of education imposes lower chances of becoming self employed; this result rises and is consistent across years; and also suggests that less skilled individuals are more likely to be self employed. The probability of becoming self employed rises with age and is highest among people between 31 and 54 years; this may reflect the ability of individuals within this age range to have access to capital and/or credit to start their own business, and also a decline on risk aversion. Individuals in the agricultural sector and living in rural areas are more likely to engage into self-employment than those that are not. These results are highly
correlated because workers in the agricultural sector do not need a high level of education (if any education at all), and workers in the rural area are more likely to be less skilled. Thus, when an economic recession occurs, less skilled workers will be the first to lose/quit their jobs in the wage earning market either because they get fired or because their wages drop below a certain threshold; and hence are the ones most likely to turn to self-employment as an escape from poverty and as a way of survival.

Table 2. Probit models results.

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Intercept</td>
<td>-1.6193*</td>
<td>-1.4492*</td>
<td>-1.3389*</td>
<td>-1.5849*</td>
<td>-1.5427*</td>
</tr>
<tr>
<td>Education</td>
<td>-0.0183*</td>
<td>-0.0345*</td>
<td>-0.0423*</td>
<td>-0.0406*</td>
<td>-0.0390*</td>
</tr>
<tr>
<td>Mid level</td>
<td>-0.2178*</td>
<td>-0.1331*</td>
<td>-0.1290*</td>
<td>-0.0893**</td>
<td>-0.0718**</td>
</tr>
<tr>
<td>High level</td>
<td>-0.2928*</td>
<td>-0.2430*</td>
<td>-0.0680</td>
<td>-0.0193</td>
<td>-0.2705*</td>
</tr>
<tr>
<td>Age</td>
<td>0.0294*</td>
<td>0.0295*</td>
<td>0.0272*</td>
<td>0.0320*</td>
<td>0.0277*</td>
</tr>
<tr>
<td>Mid age</td>
<td>0.1165*</td>
<td>0.1179*</td>
<td>0.0960</td>
<td>0.0928**</td>
<td>0.0728**</td>
</tr>
<tr>
<td>Mature age</td>
<td>0.0148</td>
<td>-0.0228</td>
<td>-0.0487</td>
<td>-0.1267</td>
<td>-0.0844</td>
</tr>
<tr>
<td>Male</td>
<td>-0.3593*</td>
<td>-0.3676*</td>
<td>-0.3731*</td>
<td>-0.3312*</td>
<td>-0.3519*</td>
</tr>
<tr>
<td>Rural</td>
<td>0.3413*</td>
<td>0.2306*</td>
<td>0.2438*</td>
<td>0.2045*</td>
<td>0.2806*</td>
</tr>
<tr>
<td>Agriculture</td>
<td>0.2869*</td>
<td>0.1975*</td>
<td>0.2218*</td>
<td>0.1159*</td>
<td>0.2477*</td>
</tr>
</tbody>
</table>

*Significant at the 5% level. ** Significant at the 10% level.

Does self-employment pay?

Economic returns to education are usually defined as the perceived wage increase that results from having an extra year of schooling; therefore, it can be argued that a higher level of education will send a signal to markets that more educated individuals have more skills and knowledge, and hence will be more productive, thus should earn higher wages.

Poor people usually have less education; their earnings come mostly from labour. Formal markets will reward more those individuals with higher levels of education and skill, and therefore the earning potential of self-employment may be very attractive, especially for the less skilled.
In this section we test the returns to education through a traditional Mincerian equation for two samples: wage earners and the self employed. The primary specification for the conditional expectation function for earnings in our analysis is a semi-logarithmic spline and step model (as specified by Hungerford and Solon 1987), where the logarithm of worker’s earnings is set to depend upon years of education and potential years of experience in a non-linear fashion, as follows:

\[
\ln W = \alpha_0 + \beta_1 Y + \beta_2 P(Y - 6) + \beta_3 J(Y - 9) + \beta_4 H(Y - 12) + \varepsilon_1 E + \varepsilon_2 E^2 + \delta_{\text{rural}} + \delta_{\text{agri}} + \delta_{\text{mills}}
\]

(12)

Where:

- \( \ln W \) = natural logarithm of the worker’s wage per hour.
- \( Y \) = years of completed education
- \( E \) = number of years of potential labour market experience.\(^9\)
- \( E^2 \) = squared experience.
- \( \text{Rural} \) = dummy variable set to one if the individual lives in a population area of less than 2500 people.
- \( P, J, H, C \) = indicator functions that take the value of one if the individual has completed primary school, junior high, high school and college respectively.\(^10\)
- \( \text{Agri} \) = dummy variable set to one if the person works in the agricultural sector and zero otherwise.
- \( \text{Mills} \) = inverse mills ratio (IMR)\(^{11} \).

The data used for testing comes from the samples specified in table 1 beforehand. Full results are presented on Annex 1.

The findings suggest that for individuals working as employees, wage earnings increase for every level of education, that is, more education translates into higher earnings. Diploma effects are significant at each level; on average, each year of
schooling represents an increase of 6% while each year of experience increases wages by 7%. In addition, belonging to a rural area or working on an agricultural sector decreases the returns.

In the case of self employment, only primary and college diploma effects are significant with each year of additional education paying roughly 5% more on average whilst years of experience increase wages. Belonging to a rural area or working on an agricultural sector decreases earnings, being this last estimate, the one with the most remarkable difference among working choices.

Positive and significant selection was found in both samples, although it was considerably greater for those falling into the self-employment category; which suggests that the wage distribution paid to the self employed is higher than that paid to wage earners. The following graphs were obtained with observed data, they show that, in effect, the self employed earn more, on average, when compared to their wage earning counterparts.

In Mexico, self-employment has a very high concentration of people with very low schooling; this might be explained by the fact that companies (specially medium and
large size ones) require a basic schooling level (at least primary school finished) to hire workers.

As observed in Fig.1, for people with no education, the 1994 economic crisis hurt most those into the wage earning sector. In 1994 both sectors perceived similar wages, however as the crisis shock was absorbed in 1996-1998, wages fell considerably for the wage earners and remained stable for the self employed; hence, an earnings gap emerged between wage earners and self employees compared to 1994 levels. This is explained by the fact that one of the ways companies react to economic shocks is by reducing costs; the less skilled are usually the ones that earn less in the salaried sector, so on times of crisis, their real wages drop to levels even lower, and this might be a reason to enter self-employment other than being unemployed. However by 2000 this gap closed as both sectors perceived similar average wages, with the main difference being the non pecuniary gains given by self-employment; this trend persisted through to 2002.

![Wage per Hour. Education=6](image)

**Figure 2. Six years of education**

Figures 2 and 3 show that, for individuals finishing primary and secondary school respectively, average earnings are higher for the self employed for every year sampled. After the crisis there was a higher reduction in the perceived earnings of the
self employed compared to wage earners. However, self employees were still earning more, and recovered faster from the crisis shock than the wage earners did.

Finally, figure 4 shows that for the main interest period (1994-1996) the earnings were not substantially different between the two employment groups. After the shock was sufficiently absorbed, wage earners started receiving higher wages than the self employed did. However, for those people who might have been hurt more by the crisis
(typically the less skilled) self-employment did represent an escape from inflation and poverty, and this result can be extended up to those with nine years of education.

V. Implications and Conclusions.

This paper tried to provide evidence for self-employment as an explanation for the observed reduction in inequality found by Acevedo (2004) for the 1994-1996 period, that contradicted the labour hoarding hypothesis (which stated that the inequality was expected to increase because the only asset of the poor was labour, the rich had more ways to protect their assets and when economic downturns were present, firms would hoard skilled labour, hence firing the less skilled.)

A simple model was presented where probit equations were estimated to discern the characteristics of the self employed; and results suggested that woman, people living on rural areas and workers in the agricultural sector are all more likely to become self employed; such results were expected according to labour theory.

Due to the composition of the sample and the nature of the working choice, self selection bias correction was needed, once this was completed, positive and significant selection towards self-employment was revealed, implying that the wage distribution paid to self employees was higher than that paid to wage earners. This might be partial evidence to prove that the self employed earn a risk premium because of the greater uncertainty of their earnings as suggested by Kanbur (1982).

The graphs presented provide evidence that, especially for the less skilled, and those with less than nine years of education, self-employment was the alternative that paid best through all the years covered by the study; for higher levels of education the findings are mixed, but incline towards a higher level of earnings for individuals in the wage-earning sector. However, for the sample of our interest, self-employment may be considered as an escape to inflation and staggered wages during crisis.
Mincerian equations were performed to obtain estimates of returns to education for wage earners and the self employed, the main differences being higher and consistent returns to all levels of education for the wage earners, and a marked decrease of earnings for individuals working in the agriculture sector which was greater if the individual was self-employed.

Self-employment has been an escape to inflation and staggered wages bringing as a consequence reduced inequality. Policy implications can be drawn from this: self-employment should be promoted by creating the appropriate environment for entrepreneurship; fewer restrictions to credit which translate into better and easier access to capital and reduction of financial risk (or premiums to offset it) might prove effective in increasing entrepreneurial activity, which would in turn improve economic conditions and accelerate economic growth.

Further work may be directed into finding any other factors that shed light on explanations for the labour hoarding hypothesis contradiction and expose the model presented here to other countries with similar economic conditions. In addition, it would be convenient to revise the consistency of the results across the differing definitions of what is considered a self-employed individual, and different estimation and measurement methods. It is also important to explore the extent to which the fact of becoming self-employed is a result of i) a proper choice made by individuals or ii) a situation on which individuals were pushed by the economic circumstances.
## Annex 1

**Estimation of returns to education**

<table>
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<tbody>
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<td>Self</td>
<td>Wage</td>
<td>Self</td>
<td>Wage</td>
<td>Self</td>
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<td>0.098139*</td>
<td>0.038184*</td>
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<td>$\epsilon_1$</td>
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<td>0.082042*</td>
<td>0.064604*</td>
<td>0.072162*</td>
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<td>-0.00072*</td>
<td>-0.00076*</td>
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<td>$\delta_1$</td>
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<td>$\delta_2$</td>
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<td>-0.04265</td>
<td>-0.23873*</td>
<td>-0.06481**</td>
<td>-0.17753*</td>
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<td>$\delta_3$</td>
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<tr>
<td>$R^2$</td>
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<td>1357.88</td>
<td>162.66</td>
<td>1284.68</td>
<td>93.00</td>
<td>988.57</td>
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</table>

*Significant at the 5% level
** Significant at the 10% level
References


Results corroborated by authors’ calculations.

Notice that the presence of physical capital is not necessarily required for employment, however to the extent that it generates some returns or even as a reserve it can alter behaviour, (for example; a fixed rent may change the attitude of an individual towards risk in the labor market).

This exclusion is made so we can focus on a situation where the employment choice is not influenced by wealth and capital holdings.
Acevedo (2000) considers that the sample should include individuals working at least 20 hours a week (part time employees), however, as individuals perceive self-employment as a form of attaining flexible working hours, we allow this variable to be set at hours>5. Additional estimations were made using the benchmark of 20 hours and results were not found to be significantly different to the ones obtained in this study.

To ensure that we do not take out from the sample some individuals who work less hours a week than part time jobs.

It should be noted that self-employees are people working for themselves whereas the “otherwise” definition includes only wage/salary earners on agricultural/not agricultural sectors.

Full results are not included in this paper, but are available on request.

The result holds for both divisions of education by level.

Experience= Age – Years of education – 4.

Years 6,9,12 and 17 are the diploma years corresponding to those levels, however, a spline for graduate school years is not used because the sample at this level is very small.

IMR is included as a regressor to allow testing for selectivity.