Informality and the Expansion of Social Protection Programs. Evidence from Mexico

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Abstract

This paper examines the effect of a large expansion of social protection programs on informality using the case of Mexico. A new social protection system based on two programs was created during the last decade. The first is the social protection in health system that provides a minimum set of health benefits to the population not covered by the social security through an insurance scheme called *Seguro Popular* (SP). The second is a conditional cash transfer called *Oportunidades*. Both theoretically affect incentives to work in the informal sector. The first decreases the cost of working informally and the second increases benefits of concealing income by working informally. Using the fact that these programs were introduced in different municipalities at different times, we show that, surprisingly, neither program significantly affected overall informality. While informality significantly increased for some sub-groups after the introduction of *Seguro Popular*, the increase was less than 2 percentage points. We also find no effect of *Seguro Popular* on job transitions between formal and informal occupations, and no effect on wage differentials between the formal and the informal sector.

Introduction

Social security programs are designed to protect workers from the consequences of health shocks and labor market shocks. Additionally, social protection programs step in to insure a basic standard of living for vulnerable populations. However, these types of programs have the potential to distort labor supply. On the one hand, social security programs can incentivize workers to choose jobs that do offer such benefits and thus reduce job mobility (Madrian, 1994). On the other hand, welfare programs can make work itself less attractive (Eissa and Hoynes, 2004). While labor distortions due to welfare benefits have been widely studied for developed countries, and in particular for the US, developing countries offer an opportunity for fresh insights because a substantial share of workers are in the informal sector (Perry et al., 2007), i.e. in jobs that do not allow them to be registered for health benefits or pensions.[1] To protect workers without health benefits from the risk of catastrophic health expenditures, some governments offer a publicly provided health system that covers basic health needs. Yet, such a public health scheme could incentivize workers to remain or become informal. As a result, the cost of the public health scheme could become much greater than anticipated, and additional taxes may need to be raised on the formal sector to finance the program, leading to further distortions. With respect to welfare policies, a means-tested welfare program may encourage informality in as much as concealing income from informal activities is easier than concealing income from formal activities.

Mexico constitutes an ideal ground for testing these key hypotheses about the impact of social protection programs on informality. About half the Mexican labor force works in informal jobs[2] and, during the last decade, Mexico created a new social protection system based on two pillars. The first, *Seguro Popular* (SP), is a health system that provides a minimum set of health benefits to the population

[1] We will define informality as those salaried workers without access to health benefits. However, there exist several definitions of the term. See Maloney (2004), Levy (2008) and Heckman (2010).
[2] See Heckman (2010).

not covered by the social security through a formal insurance scheme. The program is in practice free to workers. Additionally, the conditional cash transfer program *Oportunidades*, which started out in 1997 in rural areas under the name *Progresa*, has been extended to urban areas. *Oportunidades* is means-tested since it requires participants to have an income proxy below a certain threshold (this will be explained in more detail below). Both Seguro Popular and urban *Oportunidades* were introduced in different municipalities at different times, which allows for identification of their effects on informality through panel estimation.

We use several definitions of informality that include self-employment, no access to health services, workers in firms with less than five employees and employees who did not sign a contract in their job. We first show that the level of informality in a municipality or state prior to the introduction of Seguro Popular does not determine when Seguro Popular is eventually introduced. More generally, the timing of the introduction of the program is not correlated with most observables, suggesting that it was close to random. We then move on to analyzing the impact of Seguro Popular on informality. Whichever definition of informality is used, Seguro Popular does not significantly increase informality. The increase is of the order of 1 percentage point and is insignificant over the whole employed population. However, if we restrict the sample to workers with less than nine years of schooling, we find that Seguro Popular was associated with a significant 0.8 percentage points increase in informality (60% of workers are informal in this group). Slightly larger significant increases in informality are found when further restricting the sample to married workers with children or to workers over 34 years old. The heterogeneity in the impact is likely explained by the fact that some workers are more likely sensitive to the availability of health insurance when choosing to work formally or informally. Additionally, the small size of the effect suggests that the bulk of workers do not choose between formal and informal jobs based on the availability of health insurance.

In addition, we analyze the effect of SP on the probabilities of transition from and to informal jobs, the other possible states being formal employment and non employment. We take advantage of the Mexican labor surveys and their panel structure that includes information about the employment situation of the Mexican population, demographic data of respondents including the sector of economic activity, working conditions (benefits, hours worked, union status, etc.). The expansion of SP should increase the incentives to transition to the informal sector from unemployment or formality, and decrease incentives to participate in the formal sector. However, we do not find any significant effect on any of the probabilities, even restricting the sample to workers with less than 9 years of education. Additionally, if workers who move between the formal and the informal sector value health insurance benefits, one would expect, all other things equal to see a decrease in the wage differential between the formal and the informal sector. We thus analyzed the impact of Seguro Popular on wage gains for workers moving from the formal to the informal sector, as well as for movers in the opposite direction. We find no significant effect of SP for either direction of the move. The absence of an effect on wages suggests that marginal workers do not value health benefits much.

These findings should be reassuring to policy makers: *Seguro Popular* offers workers protection against catastrophic health expenditures with minimal distortion of labor supply decisions. These results thus make it more likely that *Seguro Popular* is welfare improving. Since urban *Oportunidades* was introduced during the same period as Seguro Popular, it is possible and desirable to examine both programs together. We find that *Oportunidades* did not have a significant impact on informality. The absence of an impact of *Oportunidades* may be explained by the fact that one could only apply for urban *Oportunidades* during a short time window prior to introduction, and few people were let into the program after its initial introduction. This minimizes the opportunity for people to learn about the program and adjust their labor supply decisions to increase their chances of qualifying.

This paper makes three key contributions to the literature. We examine the much debated impact of Seguro Popular on informality (Levy [2008], Bosch-Campos [2010]) both overall and on groups that are expected to be more sensitive to the introduction of the program. Indeed, we use the ENE and ENOE labor force surveys from 1995 to 2009, which allow for analysis at the yearly level. By contrast, Barros (2009) focused on the impact of Seguro Popular on health using ENIGH, a household survey that is conducted on average every couple of years. He also examined the impact of Seguro Popular on informality and found no effect. However, the effect may be hard to identify in ENIGH, and he only allowed for limited heterogeneous effects across groups, distinguishing between household head and other household members. The second contribution of the paper is to establish with great confidence that the impact of *Seguro Popular* on informality is small, even for the groups whose informality did significantly increase after the introduction of the program. This is a key finding for two reasons. First, it suggests that *Seguro Popular* may be welfare improving since it protects workers while having a minimal impact on labor supply decisions. Second, it shows that few workers choose between the formal and the informal sector based on the availability of health insurance benefits. The third key contribution of this paper is to examine for the first time the impact of urban *Oportunidades* on labor supply. We find that *Oportunidades* does not significantly increase informality, despite the incentive to work informally in order to pass the means test through income underreporting.

The remainder of the paper is organized as follows. We first give some institutional background on *Seguro Popular* and *Oportunidades*, and discuss their potential impact on informality. Second, we present the data. We then examine the results, and finally we conclude.

The Mexican Social Protection System and Informality: Institutional Background and Theoretical Framework

Seguro Popular

Mexico has created a new social protection system over the last decade. One of the pillars of this system was the implementation of the System of Social Protection in Health in 2004. Before that year, access to health institutions in Mexico was been linked to formal employment and covered on the basis of charges to cover employees and employers. Two main institutions were the main providers of services, *Insituto Mexicano del Seguro Social* (IMSS) and *Instituto de Seguridad y Servicios Sociales de los Trabajadores del Estado* (ISSSTE). Individuals who had no formal employment had access only to services provided by the Ministry of Health (SSA) or private medical services; these individuals represent half of the total population of the country. This situation resulted from the evolution of the social security implemented in1943 –when IMSS was created. The system was designed with the idea that industrialization would expand formal employment and consequently all population would be covered by social security.

The services provided by the SSA did not ensure access to a package of services and medical procedures and user fees were required for medications and some medical services. Thus, in the event of a health shock, uninsured individuals could face catastrophic health costs or simply chose not to seek medical attention. In either case the welfare of these families could be seen significantly affected.

In order to correct this situation, in 2002 the Mexican federal government introduced a pilot program called *Seguro Popular* to provide medical coverage to those individuals not covered by social security. The objective was to minimize vulnerability to catastrophic and impoverishing health expenditures of the population not covered by social security, thus reducing inequalities of basic health opportunities. The relative success of this pilot took authorities to create the system for Protection in Health in 2004.

This reform transformed the health care system in a health insurance system. The vehicle for this aim is a public, voluntary scheme called Popular Health Insurance, or Seguro Popular (SP). It subsidizes an explicit set of health interventions and it is the mechanism used to reach universal health coverage of the Mexican population by 2011. The main requirement to be eligible for the program is not being insured health institutions serving the formal sector (mainly IMSS and ISSSTE), either because they are informal workers or because they do not work. In theory, the SP premium is progressive, individuals in the first two deciles of income are exempt from payment, and increases with income level for the other deciles. But in reality only 2 percent of the total beneficiaries make any payment at all (CNPSS, 2009).As a result, health spending has increased substantially to cover the costs of increased demand for health services and to increase system capacity. *Seguro Popular* represents the largest effort in Mexico to extend coverage of health services since the creation of the *Secretaría de Salud* (SSA) and *Instituto Mexicano del Seguro Social* (IMSS- the provider of social security for formal workers and their families) in 1943.

The provision of these services does not rely on the federal authorities alone. State governments play a key role in the coverage and functioning of the program. According to the current rules, the federal government funds 83% of total annual cost of the insurance of every affiliate while state governments pay the remaining 17% and bear a part of the infrastructure of health services. The total number of beneficiaries in the program and the corresponding funds to the states is defined by the federal and state governments through an *Acuerdo de Coordinación*. Once the target of affiliation is set, state health ministries define the *Regímenes Estatales de Protección Social en Salud* (REPSS) or rules for the affiliations in every state. These rules must follow a statistical procedure similar to the one used by *Oportunidades:* the rules determine that every affiliated dwelling must be identified and classified into income deciles in order to determine the contributory category they belong to. This is done using a discriminant analysis model provided by the *Comisión Nacional de Protección Social en Salud* (CNPSS).

There are some exceptions to this protocol, and federal and state governments can determine the affiliation of dwellings without the classification.[3] Finally, the beneficiaries of other federal social programs, particularly *Oportunidades,* can be automatically affiliated to *Seguro Popular.*

One of the main objectives of *Seguro Popular* is to reduce the inequality of public spending in health across states and provide a minim to all Mexicans.

Seguro Popular has been introduced in all 31 states and Mexico City. Total expenditure and coverage differ widely among states (see figures 4 to 7), and the observed differences are not consistent with the compensatory objective of converging towards equal spending per capita across states. Up to 2010, the SP package includes 266 medical interventions, which go from routine check-ups to third level surgeries.

Progresa-Oportunidades

The other pillar of the Mexican Social Protection System is represented by an income redistribution strategy through a conditional cash transfer. It started in 1997 as *Programa de Educación, Salud y Alimentación* (Progresa) as the principal anti-poverty program of the Mexican government. In 2002, the program was renamed *Oportunidades*.

The program was designed with the objective of breaking the intergenerational transmission of poverty by investing in the human capital of new generations. It provides cash transfers and other services needed to satisfy the minimum for food, health and education. The cash transfer is conditioned on regular school attendance for children, and health clinic visits. The program was designed under the assumption that poverty is the result of low acquisition of capabilities that translates into bad functioning during adulthood, a phenomenon that has been replicated during the past generations.

The program has three main components:

[3] The rules allow for collective affiliations of specific groups. These may be negotiated by unions, production organizations or any other NGO or government agencies. See Scott (2006)

1. Health and nutrition services

2. Food subsidy in cash equivalent to 35 kilograms of tortillas per month.

3. Educational grants for students under 22 and older than 10.

The first two refer to a basic plan of preventive health care, pregnancy care, nutritional supplements, and bimonthly cash subsidy to avoid malnutrition in children. The educational grants are granted to each member of the household under twenty one years old. They must be registered full-time in school between the third grade of primary school and the third year of intermediate school. Beneficiaries are required to take preventive care and attend at least 85% of classes in order to receive the cash transfer, which is given directly to the mother in the household.

The amount of money varies depending on the years of schooling and the gender composition of children. The grant is higher for females in secondary and high school. The purpose of this difference is to reduce the gap in school attendance by gender given that females tend to leave their studies in greater numbers and at earlier ages than males. The full description of this benefit is included in Table 4.

The program is targeted using both geographical targeting and proxy means tests. Families are chosen according to the methodology designed by the federal government level. The resources are the responsibility of the federal government, but the program also involves the local governments in the provision of health and educational facilities. The historical affiliation and the geographic distribution of the affiliates are described in Figure 2 and Figure 3.

The change from Progresa to Oportunidades in 2002 included a redefinition of the methodology followed to select the eligible households, the inclusion of urban areas and the extension of the educational grants to the intermediate and higher education.

Informality in Mexico

There is no official definition of informality. The Mexican Federal Labor Law makes no distinctions among economic activities and considers all workers in all sectors of the economy for being included in the formal social security system. Given this situation, we decided to use several definitions of informality based on the requirements to be covered by Seguro Popular. The Federal Law on Health clearly states that all population not covered by any of the social security systems or without access to health services can be covered by Seguro Popular. 4 So we used the following definitions:

1. NHSE. Workers who declared being not covered by social security or self-employed
2. No Health. Workers who declared not being covered by social security only.
3. Small firm. Workers who declared to be employed in firms with less than 5 employees.
4. No Contract. Workers who declared not signed a contract in their current occupation.

Using the first definition, the average size of informality is around 50% (Table **1**). This will facilitate our analysis, since linear probability and probit models have the same point estimates when the average value of the variable is close to 0.5.

Theoretical framework

Seguro Popular is a health benefit that is given to those who work informally or do not work at all. Since this paper considers the impact of *Seguro Popular* on informality, we concentrate on the choice between working in the formal versus the informal sector and ignore the choice of being out of the labor force. Assume that the utility of working in a formal job is given by $U_f = w_f + \alpha b_f U_f = w_f + \alpha b_f$,

[4] The Federal Health Law says. "Article 77 bis 3.- All households and people not covered by social security institutes or have no health coverage will be included in the System for Social Protection in Health according to their official address. This will guarantee access to all health services provided by the law. (Translation by the authors).

where w_f is the wage in the formal sector, b_f are non-pecuniary benefits in the formal sector, and $\alpha \leq 1$ is the value that workers place on non-pecuniary benefits. Similarly, the utility of working in the informal sector is $U_i = w_i + \alpha b_i$. A worker chooses to work in the informal sector if $U_i - U_f > 0$, i.e. if $w_i - w_f + \alpha(b_i - b_f) > 0\, w_i - w_f + \alpha(b_i - b_f) > 0.$

Seguro Popular increases the value of b_i and hence the utility of working informally relative to the utility of working formally. In other terms, Seguro Popular should, all other things equal, increase the proportion of informal workers by encouraging formal workers to become informal and discouraging informal workers from becoming formal. Given the substantial flows between the formal and the informal sector in Mexico (Bosch and Maloney, 2007), both mechanisms should be at play. However, how large the effect of *Seguro Popular* on informality may in practice depend on a few additional considerations. First, even prior to *Seguro Popular*, workers without health coverage could access public clinics and benefited from a small subsidy. *Seguro Popular* makes this subsidy much more substantial and systematic. Still, the impact depends on how much larger b_i is with Seguro Popular compared to the situation prevailing before the introduction of the program. As of 2008, the cost of Seguro Popular was 1779.6 pesos per enrolled person, which represents 5% of workers' yearly wages. This amount is fairly substantial as it is close to the share of health insurance costs in total compensation for the US. i.e. 6.7% (Gruber and Madrian, 2002). Second, the impact of *Seguro Popular* on informality depends on how large α is: the more workers value non-pecuniary benefits, the larger the impact. This suggests that older workers, whose health tends to be poorer, may be more likely to become (or stay) informal after the introduction of *Seguro Popular*. Additionally, in Mexico, formal sector workers can cover their family. Thus, the value of benefits is higher for the first family member who works formally, and so there is a stronger incentive for primary earners to work in the formal sector. Thus, we expect the impact of *Seguro Popular* on informality to be stronger for workers who are married with children. Finally, the

impact depends on how many workers are close to indifferent between working in the informal versus the formal sector, and could thus be swayed by a change in benefits in the informal sector. The fact that there are many workers who switch from the formal to the informal sector and vice-versa suggests that many workers may be close to indifferent between the two sectors, and therefore that the effect of Seguro Popular on informality may be large. Overall, we expect that informality will increase more for less educated workers when Seguro Popular is introduced, as these workers are more likely to be informal to start with. Indeed, highly qualified workers such as engineers, would typically work for larger firms that tend to be formal, and hence have less opportunities to practice their trade informally than, say, a salesperson. To summarize then, we expect Seguro Popular to increase informality, and this effect should be larger for older, married with children, and less educated workers.

In the empirical analysis, we will also examine the impact of Seguro Popular on transitions between the formal sector, the informal sector, and non-employment, as well as on the wages of workers who move between the formal and the informal sectors. The rationale for looking at transitions is that if informality became more attractive after the introduction of Seguro Popular, we may expect to see more transitions from formality to informality and fewer transitions in the reverse direction. With respect to wages, since a worker chooses to work in the informal sector if $w_i - w_f + \alpha(b_i - b_f) > 0\, w_i - w_f + \alpha(b_i - b_f) > 0$, we expect that workers are induced to move from the formal to the informal sector by a lower wage differential $w_i - w_f$ after the introduction of Seguro Popular, i.e. as $\alpha(b_i - b_f)$ increases (this is a version of the theory of compensating differentials). If this is so, then the wage change for workers who move from the formal to the informal sector should be lower after the introduction of Seguro Popular, and conversely the wage change for those who move from the formal to the informal sector should be larger.

With respect to the impact of urban Oportunidades on informality, the introduction of the program to urban areas may be associated with higher informality. The program has been very successful in the countryside, but there informality is not really an issue in that most agricultural jobs are informal and formal jobs are mostly unavailable. As mentioned previously, the program is a conditional cash transfer and it is means-tested. There is some anecdotal evidence that applicants tried to pass as poor by hiding their assets when being visited at home by evaluators. Similarly, people may prefer to work informally in order to be able to conceal their income more easily. We thus expect the introduction of urban Oportunidades to be associated with an increase in informality. As in the case of Seguro Popular, we expect this increase to be larger for groups that are nearly indifferent between working formally and informally. However, the incentive for informality may not fully play out given the way the program was implemented. Indeed, in each municipality where the program was introduced, people only had two months to go to a sign-up module and apply for the program, and as a result only 40% of the potentially eligible people applied (Behrman et al., 2009). After this initial two-months enrollment phase, very few additional households joined the program. What this means is that there was little time for people to learn about the program and think of strategies to qualify for it, such as holding an informal job. Still, we feel it is important to test whether the introduction of Oportunidades to urban areas was associated with an increase in informality. Also, the timing of the introduction of Oportunidades is somewhat similar to the timing of the introduction of Seguro Popular, and, where Oportunidades was present, it was a key mechanism for enrolling people in Seguro Popular (Scott, 2006). It is thus important to look at the impact of both programs on informality in order to ascertain which one, if any, had a greater effect.

Data

This paper employs four sets of data: census data for total population and households, labor surveys, and the roll out information of *Progresa-Oportunidades* and roll out information of *Seguro Popular*. The

first two sets are provided by *Instituto Nacional de Estadistica y Geografia* (INEGI), Mexican bureau of Statistics and the *Consejo Nacional de Población* (CONAPO), the only Mexican agency legally in charge of providing official demographic estimations. The information on *Progresa-Oportunidades* was taken from the historical census of beneficiaries. It was provided by the National Office of Oportunidades (*Coordinacion Nacional de Oportunidades*). Finally, the information on *Seguro Popular* was provided by the *Comision Nacional de Proteccion Social en Salud*, the federal agency that coordinates the affiliation and expansion of the program through the country.

Total Population and Households

Our analysis includes demographic information on population and total number of households at the village level, similar to the one used by INEGI. Every village in Mexico is identified with a number of nine digits: two for the state, two for the municipality and four for the village number. Using the official identification numbers we created a database that contains official records of total population for the censuses of 1990 and 2000. It also contains the information of the partial censuses of 1995 and 2005.

We estimated the total population for the intra-census periods using the compound rate of growth between censuses.[5] This was done for the periods 1991-1994, 1996-1999 and 2001-2004. For the period 2006-2009 we used the official population estimations by CONAPO at the village level. To estimate the total number of households during the period, we assumed the same household size of 2005 and extrapolated it using the information on population.

Once the dataset was completed, we classified every village according the census 2000, which was used to determine the expansion of Progresa-Oportunidades and the implementation of Seguro Popular. The purpose of this classification was to restrict the sample to eligible population for the urban expansion of

[5] Every year information was estimated using the compound rate of growth (crg). Where: $crg = \left(\frac{Value_t}{Value_{t-5}} \right)^{\frac{1}{5}} - 5$

both programs and to exclude villages with less than 50,000 inhabitants, i.e. the rural and semi-urban villages.

Employment Surveys: ENE and ENOE

The information on employment comes from the Mexican Labor Surveys from 1995 to 2009. For the period 1995-2004, we used the National Employment Survey (ENE) and for the period 2005-2009 we used the National Survey of Occupation and Employment (ENOE). They provide homologated series of information on occupational characteristics of the national population and other demographic and economic variables that allow deeper analysis of labor market conditions across the country.

In each of these surveys, every economically active worker of the selected dwellings is interviewed for five consecutive quarters and then replaced by a new representative unit of analysis.[6] To avoid any invalid comparisons across time and any attrition issues, we only used the first interview of every individual in our first analysis. In our transition and wage analysis, we took advantage of the panel structure.

The data provides information on all jobs and occupations of the population. Following the trend in the recent literature, we decide to define informality according to the legalistic definition. According to this view, workers are classified as informal if they work for a firm that does not provide health benefits. This is a legalistic definition because employers are mandated by law to provide health coverage and therefore not providing it is illegal. Additionally, we also consider self-employed workers as informal, since they typically do not provide themselves with health benefits[7].

[6] For more details see INEGI (2007), a comprehensive description of the surveys.
[7] The question about health benefits was not asked of self-employed workers.

Other controls

We created a dataset that contains information by municipio during the period 1995-2009, that includes the total number of doctors, total number of hospitals and the local total consumption of electricity. Both variables are key to understand the response of individuals to local conditions. In the first case, the scarcity of health services in a municipality would make *Seguro Popular* less attractive since access to health care would be de facto limited. The second control, the yearly growth of electricity consumption, was taken as a proxy for the local economic conditions in the municipio. As described by Heckman (2010), formal employment seems to be closely related to economic performance. We created these variables using as reference the state statistical yearbooks for all of the states in Mexico. This is a publication by INEGI and integrates selected statistical information on socio-demographic and economic aspects, which are used for under a complementary approach-to statistics generated by the recent national censuses and surveys, and which is obtained from state administrative records. The information on doctors and hospitals are reported directly from the state ministries of health and the information on electricity consumption is provided directly by the two public electric companies in Mexico: Compania de Luz y Fuerza del Centro (CLyFC) and Comisión Federal de Electricidad (CFE), both monopolies one for the central part the country and the other for the rest of it.[8] All data was coded to be merged to the labor information at the municipio level.

[8] CLyFC disappeared a year ago and CFE is now the national producer, distributor and retailer of electricity in the country.

gives summary statistics. Note that 50% of population works informally, i.e. has no health benefits or is self-employed. The years of introduction of Seguro Popular range between 2002 and 2009, while the years of introduction of Oportunidades range between 2001 and 2005. We now turn to the analysis of the impact of these programs on informality.

Results

Endogeneity analysis

Before examining the impact of Mexico's social protection programs on informality, it is prudent to assess to what degree our identification strategy is valid. Indeed, using the timing of the introduction of Seguro Popular as a source of identification assumes that this timing is not correlated with the key outcome of interest, i.e. labor market informality. While it is not possible to test directly whether the timing of the introduction of Seguro Popular was endogenous, we can shed some light on the issue at hand by examining whether the year of introduction of Seguro Popular is predicted by observable variables in 2000, at either the municipio or state level.

For municipalities, we use a complete set of characteristics from the Census 2000, which is prior to the earliest implementation of SP in 2002. In As shown in Table 7, we found that municipios with a higher share of informal workers were covered significantly later than average (column 1). However, once we control for the fixed effects by state (column 2), this coefficient is lower and becomes insignificant. In columns 3-6, we add different sets of controls at the municipality level. Most controls are insignificant, and informality never becomes significant. Finally, in column 7, we restrict the sample to larger municipios with more than 50000 inhabitants, which is the sample restriction that we use for our main analysis. In this case again, informality does not have a significant effect on the year of introduction of Seguro Popular. We do find some indication that within states and among larger municipios, poorer municipios were included earlier as is evidenced by the negative and significant coefficient on indicators of poverty like % no electricity, % overcrowded, % earning less than 2 minimum wages (column 7). Also, within states, municipios with more hospitals were included later, possibly again because these municipios were relatively better off (cols. 6 and 7).

Finally, we repeated this analysis at state level. The reason for doing this is that State governments play a key role in the coverage and functioning of the program. Indeed, the total number of beneficiaries in the program and the corresponding funds to the states is defined by the federal and state governments. The results are shown in Table 8. In this case, the value of the level of informality as predictor of the year of introduction has a negative sign, but the coefficient is not significant. Some accounts of the program implementation suggest that smaller states were covered first (Gonzalez-Pier[2006] and personal interview). The federal authorities first implemented the plan looking for a small scale and, once they verified its functioning, more states were included. This suggests that observed variables like the political party of the governor and the total population were potentially important in determining the expansion, and not the local conditions in the labor markets. However, in practice, the state's population and the governor's political party are not significantly associated with the timing of the introduction of Seguro Popular at the state level (cols. 3-5). Importantly, none of the specifications show a significant impact of informality on the year of introduction of Seguro Popular at the state level.

Overall, we can conclude that there is no evidence that informality in states or municipalities determined the timing of the expansion of Seguro Popular. Additionally, there are very few variables that are consistent predictors of the timing of the expansion, which suggests that this timing was close to random. These results thus further support our identification strategy.

Informality

We estimate linear probability models, regressing the indicator for informality on an indicator for the presence of the program under consideration. We always include municipality fixed effects and report robust standard errors clustered by municipality. Table 2 presents the results for Seguro Popular. In column 1, without controls, Seguro Popular is found to have a negative and insignificant effect on informality. In column 2, as controls are added, the effect of Seguro Popular becomes positive but

remains insignificant. Note that the controls themselves (age, gender, schooling and sector of work) are associated with informality in the ways described by the literature on informality in Latin America (Perry et al., 2007). The main reason why the coefficient on Seguro Popular becomes positive when controls are added is that informality as defined was trending downwards around the time when Seguro Popular was introduced, and therefore there is some degree of mechanic negative correlation between Seguro Popular and informality. The year fixed effects allow for the removal of this mechanical correlation. In subsequent columns, we focus on sub-groups in the population that are more likely to see their informality status affected by Seguro Popular. We first examine the case of less educated workers, and specifically workers with 9 years of schooling or less (9 years is the median of the schooling distribution). We argue that these workers are more likely to have opportunities to work in the informal sector than more educated workers. For less educated workers, Seguro Popular is found to significantly increase informality, both without and with controls (columns 3 and 4). Controlling for relevant covariates, we find that less educated workers are 0.8 percentage points more likely to work informally after the introduction of Seguro Popular (60% of this group works informally on average). The effect of Seguro Popular on males is positive but falls short of statistical significance, once relevant controls are added (column 6). Among less educated workers, the effect of Seguro Popular is stronger for those workers who are married with children (column 8) or over 34 years old (this is the median of the age distribution; see column 10). Thus, as expected, married workers with children are more likely to react to the introduction of Seguro Popular becausethey would provide health benefits for their whole family if working in the formal sector. The value of health benefits is thus higher for married workers with children than for workers who are only seeking to cover themselves. As for older workers, their health is presumably somewhat worse than the health of younger people and hence the value of health benefits is higher for them. This could explain why they react more strongly to the introduction of Seguro Popular.

For all three sub-groups where a significant effect of Seguro Popular on informality was found, the effect was of the order of 1 percentage point, which is a very small effect given that half the labor force is informal. This suggests that either Seguro Popular did not provide much value so that the increase in health benefits for informal workers was minimal, or that very few workers choose to be formal or informal on the basis of the availability of health benefits. The first explanation is not very plausible. Indeed, while Seguro Popular did not cover as many procedures initially as employment-related health plans (mostly IMSS), the coverage was expanded substantially over time. Additionally, the quality of care in Seguro Popular was arguably lower than in IMSS to start with, but it improved as well over time. More likely, workers who are otherwise close to indifferent between working in the formal and the informal sector do not value health benefits very much. Hence, even a substantial change in the health benefits provided to informal workers is unlikely to affect most workers' decisions to work informally.

One concern with the interpretation of our results is that informality was trending upwards already prior to the introduction of Seguro Popular. To address this concern, we examine informality around the introduction of Seguro Popular. Specifically, we look at informality up to four years before and two years after the introduction of the program and we restrict the sample to a balanced panel of municipalities. We also focus on less educated workers since Seguro Popular was not found to affect informality overall. Finally, we use our typical set of controls to account for other confounds[9]. Figure 1 plots the results. The coefficients are estimated relative to the year prior to the introduction of Seguro Popular. We can see that there is a significant jump in the propensity to work informally in the first year where Seguro Popular was introduced (year 0). Two and three years prior to the introduction of the program, the propensity to be informal was essentially the same as one year prior to the introduction. Four years prior to the introduction of the program, informality was significantly lower, but not much lower. Overall, there appears to be no trend in informality prior to the introduction of Seguro Popular. The

[9] The results are not substantially affected if we don't use any controls.

impact of the program in the second (year 1) and third year (year 2) after the introduction seems to increase somewhat, which may be due to the further expansion of the program. In any case, the effect of Seguro Popular in the second and third year is not significantly different from the effect in the first year. We conclude from this exercise that the estimated impact of Seguro Popular on the informality of less educated workers is likely due to the program itself, and not to a pre-existing trend in informality.

We now turn to the estimation of the impact of the introduction of Oportunidades to urban areas on informality. Indeed, since Oportunidades is means-tested, workers may have an incentive to work informally in order to be able to more easily misreport their income and qualify for the program. Since the urban expansion of Oportunidades took place during the 2000s, the same period during which Seguro Popular was also rolled out, it is important to look at the impact of both programs at the same time. Additionally, this serves as a robustness test for our results concerning Seguro Popular.

Table 3 uses the same specifications as in Table 2. We don't find a significant impact of Oportunidades on informality overall (columns 1 and 2), just as in the case of Seguro Popular. When we examine the impact on other sub-groups, we do not find a significant impact of Oportunidades on informality for any of the subgroups. Importantly, the results for Seguro Popular are broadly unaffected by the inclusion of a control for the existence of Oportundiades.

Job Transitions

As outlined above, if informality became more attractive after the introduction of Seguro Popular, we may expect to see more transitions to informality and fewer to formality. We analyze this issue by looking at the transitions probabilities of workers from formality to informality, from non employed to informal, informal to formal, and non employed to formal. We restrict the data to the first two quarters observed for each individual to minimize potential attrition bias. Additionally, we restrict the data to workers with less than 9 years of schooling, since no effect of Seguro Popular was found on the informality status of the general population. The analysis regresses an indicator variable for the transition (from the first quarter of interview to the next, and conditional on being in the specified initial state) on the indicator for the presence of the Seguro Popular, including municipality fixed effects and clustered standard errors. In

Table 5, we can see that Seguro Popular has no effect in any of these probabilities. In the first case, formal to informal, the sign is positive as the theory would suggest, but the magnitude is almost zero. In the case of the transition from non employment to informality, the sign is positive and significant without controls, but the coefficient becomes insignificant with controls. Note also that the magnitude of the effect is very small. Seguro Popular has a negative but insignificant effect on the transition from informal to formal status and the transition from non-employment to a formal job. The signs are thus consistent with what could be expected from theory but the effect is both very small and statistically insignificant. We thus conclude that Seguro Popular did not significantly affect transitions from and to informality for workers with less than 9 years of schooling.

Effect on Wages

As explained above, the theory of compensating wage differentials predicts that, after the introduction of Seguro Popular, wages in the informal sector should decrease since now health benefits are also being provided for informal workers. However, the literature on compensating wage differentials for health insurance in the US finds mixed results. Indeed, Lehrer and Pereira (2007) do not find any evidence for a compensating wage differential, even though they use displaced workers and panel data to get around some of the endogeneity problems. More generally, studies using cross-sectional or longitudinal designs have trouble finding a robust negative effect of health insurance provision on wages. On the other hand, Gruber (1994) uses a policy experiment and finds a significant negative effect. The review of the compensating differentials literature by Pauly (2001) concludes that the existing studies do not provide strong evidence for or against a health insurance compensating wage differential.

We analyzed the wages of both formal and informal workers who switch sectors from one quarter to the next. As for the transition analysis, we only retain the first two quarters of observation for each worker and we focus on workers with 9 years of schooling or less. The results are described in Table 6. We can see that Seguro Popular has no significant impact on wage changes for workers who move between the formal and the informal sectors. This suggests that workers at the margin of informality do not value health benefits much.

Conclusion and discussion

This paper has analyzed the impact of the expansion of Seguro Popular and Oportunidades in Mexican urban areas on informality. We find that the overall impact of both programs is close to zero and insignificant. This suggests that the expansion of these social protection programs had a negligible distortionary impact on labor supply. Given the well-documented benefits of these programs, the findings of this paper increase the likelihood that these programs are welfare-improving. We find that Oportunidades does not significantly increase informality for any demographic group we examined. The absence of an effect is most likely explained by the specificities of the roll-out for this program. As for Seguro Popular, we find that it was associated with a significant increase in informality among workers with less than nine years of schooling, and, among this group, the increase in informality was larger for workers who are either married with kids or above 34 years old. Even among these groups, the size of the impact remains small, as it is always close to 1 percentage point: thus, for less educated workers, Seguro Popular was associated with a 0.8 percentage point increase in informality. This suggests that there are very few workers who choose to work formally or informally on the basis of the availability of health benefits. Since we also do not find any effect of Seguro Popular on the wages of workers who move between the formal and the informal sectors, we speculate that marginal workers do not value the health benefits provided in formal jobs as much as these benefits cost employers in payroll taxes. If so, then mandating the payment of payroll taxes for health coverage of less educated workers could be partly responsible for high informality in this group. This does not imply that less educated workers should not be provided health benefits, but that payroll taxes may not be the best way of financing these benefits.

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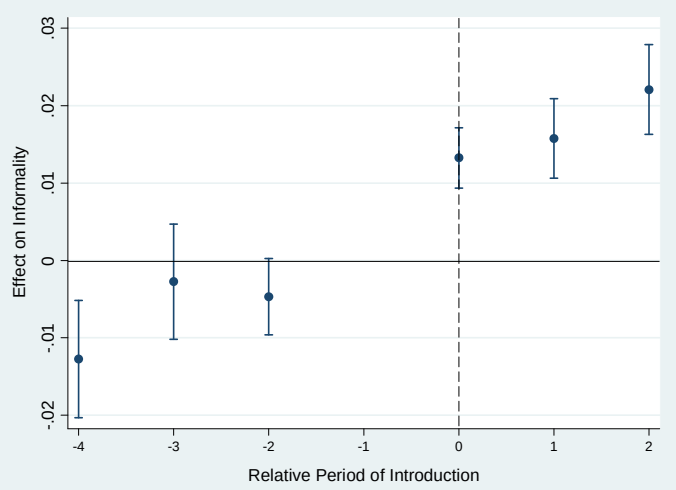
Figure 1: Informality for less-educated workers and the timing of the introduction of Seguro Popular



Notes: Coefficients on relative year estimated from a linear probability model, with controls for sector, age, age squared, gender, years of schooling, log population, year and municipality fixed effects. The sample is restricted to workers with 9 years of schooling or less. Informal is self-employed or no health benefits through the employer. Data from years prior to 4 years before the introduction of Seguro Popular and more than 2 years after the introduction of the program is not used. Balanced panel of municipalities.

Source: Authors' estimations using ENE (1995-2004) and ENOE (2005-2009)

Table 1: Summary statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
No Health Services or self-employed	706136	0.5	0.50	0	1
Gender	706136	0.6	0.49	0	1
Age	706136	35.5	12.20	15	69
Schooling	705614	10.1	4.87	0	24
Introduction Seguro Popular	704982	2004	1.56	2002	2008
Introduction Oportunidades	704982	2002	0.86	2001	2005
Economic Sector					
Construction	706136	0.08	0.27	0	1
Manufacture	706136	0.18	0.38	0	1
Commerce	706136	0.22	0.41	0	1
Services	706136	0.46	0.50	0	1
Other	706136	0.04	0.21	0	1
Agriculture	706136	0.02	0.14	0	1
Not specified	706136	0.00	0.04	0	1

Sources:
- Seguro Popular. Comision Nacional de Proteccion Social en Salud. Annual information by village collapsed by non-rural units in the by municipio
- Oportunidades. Coordinacion Nacional de Oportunidades. Annual information by village collapsed by non-rural units in the municipio
- Employment and sociodemographic variables. Authors' estimations using ENE (1995-2004) and ENOE (2005-2009)

Table 2: The impact of Seguro Popular on informality

COEFFICIENT	Sample 1 All		Sample 2 Schooling < 9 yrs		Sample 3 Males		Sample 2 Married, Schooling < 9 yrs, with children		Sample 5 Schooling<9, Age>34	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	NHSE	NHSE	NHSE	NHSE	NHSE	NHSE	NHSE	NHSE	NHSE	NHSE
Ind. SP	-0.00445	0.00878	0.03756***	0.00858*	-0.00953**	0.00909	0.00770*	0.01226*	0.02113***	0.01448***
	[0.00363]	[0.00605]	[0.00323]	[0.00460]	[0.00373]	[0.00616]	[0.00398]	[0.00623]	[0.00336]	[0.00522]
Schooling		-0.02112***		-0.02936***		-0.01378***		-0.02027***		-0.01616***
		[0.00054]		[0.00065]		[0.00054]		[0.00067]		[0.00068]
Age		-0.01902***		-0.01701***		-0.01729***		-0.00310***		-0.01575***
		[0.00104]		[0.00098]		[0.00103]		[0.00119]		[0.00177]
Age^2		0.00027***		0.00023***		0.00026***		0.00009***		0.00020***
		[0.00001]		[0.00001]		[0.00001]		[0.00001]		[0.00002]
Male		-0.01990***		-0.08026***		0.00000		0.00000		-0.13641***
		[0.00503]		[0.00675]		[0.00000]		[0.00000]		[0.00679]
Married		-0.01924***		-0.01106***		-0.08521***		0.00000		0.00023
		[0.00232]		[0.00215]		[0.00310]		[0.00000]		[0.00251]
Children		0.00283***		0.00272***		0.00219***		0.00199***		0.00101***
		[0.00026]		[0.00035]		[0.00030]		[0.00052]		[0.00038]
Electricity Growth[1/]		-0.00010***		-0.00009***		-0.00009***		-0.00011***		-0.00004**
		[0.00002]		[0.00002]		[0.00001]		[0.00003]		[0.00002]
Constant	0.51934***	0.83214***	0.58203***	0.85302***	0.51483***	0.74538***	0.53137***	0.88014***	0.69791***	1.36731***
	[0.00192]	[0.02859]	[0.00155]	[0.03091]	[0.00193]	[0.02785]	[0.00179]	[0.04743]	[0.00167]	[0.04691]
Economic Sector FE	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES
Year FE	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES
Observations	1043323	898682	608788	518014	630167	540996	179873	152016	214505	183234
Number of mn	350	318	350	318	350	318	350	317	350	318
R-squared	0.000	0.123	0.001	0.125	0.000	0.116	0.000	0.124	0.000	0.113

* significant at 10%; ** significant at 5%; *** significant at 1%
Standard errors clustered by municipio
Notes: 1/Taken as a proxy for economic activity in the municipio

Source: Authors' estimations using ENE (1995-2004) and ENOE (2005-2009)

Table 3: The impact of the introduction of Seguro Popular and Oportunidades on informality

COEFFICIENT	Sample 1 All		Sample 2 Schooling < 9 yrs		Sample 3 Males		Sample 2 Married, Schooling < 9 yrs, with children		Sample 5 Schooling<9, Age>34	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	NHSE	NHSE	NHSE	NHSE	NHSE	NHSE	NHSE	NHSE	NHSE	NHSE
Indicator SP	-0.00402	0.00865	0.03110***	0.00859*	-0.01051***	0.00888	0.00464	0.01178**	0.01598***	0.01436***
	[0.00347]	[0.00592]	[0.00320]	[0.00458]	[0.00364]	[0.00595]	[0.00418]	[0.00587]	[0.00370]	[0.00515]
Ind. Oportunidades	-0.00060	0.00816	0.00875***	-0.00047	0.00136	0.01080	0.00412	0.01452	0.00700**	0.00599
	[0.00327]	[0.00874]	[0.00302]	[0.00849]	[0.00381]	[0.00960]	[0.00435]	[0.01033]	[0.00349]	[0.00874]
Schooling		-0.02112***		-0.02936***		-0.01378***		-0.02027***		-0.01616***
		[0.00054]		[0.00065]		[0.00054]		[0.00067]		[0.00068]
Age		-0.01902***		-0.01701***		-0.01729***		-0.00309***		-0.01575***
		[0.00104]		[0.00098]		[0.00103]		[0.00119]		[0.00178]
Age^2		0.00027***		0.00023***		0.00026***		0.00009***		0.00020***
		[0.00001]		[0.00001]		[0.00001]		[0.00001]		[0.00002]
Male		-0.01990***		-0.08027***		0.00000		0.00000		-0.13640***
		[0.00503]		[0.00675]		[0.00000]		[0.00000]		[0.00679]
Married		-0.01924***		-0.01106***		-0.08520***		0.00000		0.00023
		[0.00232]		[0.00215]		[0.00310]		[0.00000]		[0.00251]
Children		0.00283***		0.00272***		0.00219***		0.00199***		0.00101***
		[0.00026]		[0.00035]		[0.00030]		[0.00052]		[0.00038]
Electricity Growth[1/]		-0.00010***		-0.00009***		-0.00010***		-0.00011***		-0.00004**
		[0.00002]		[0.00002]		[0.00001]		[0.00003]		[0.00002]
Constant	0.51951***	0.79405***	0.57970***	0.86082***	0.51445***	0.74505***	0.53029***	0.82765***	0.69603***	0.81666***
	[0.00245]	[0.02537]	[0.00201]	[0.03153]	[0.00256]	[0.02783]	[0.00241]	[0.04613]	[0.00210]	[0.05571]
Sector FE	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES
Yea FE	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES
Observations	1043323	898682	608788	518014	630167	540996	179873	152016	214505	183234
Number of mn	350	318	350	318	350	318	350	317	350	318
R-squared	0.000	0.123	0.001	0.125	0.000	0.116	0.000	0.124	0.000	0.113

* significant at 10%; ** significant at 5%; *** significant at 1%
Standard errors clustered by municipio

Notes: 1/Taken as a proxy for economic activity in the municipio

Source: Authors' estimations using ENE (1995-2004) and ENOE (2005-2009)

Table 4: The impact of the introduction of Seguro Popular and Oportunidades on informality.

COEFFICIENT	No Contract (Schooling <9 years)		Self-Employed (Schooling <9 years)		Small Firm (< 5 employees, Schooling <9 years)	
	(1)	(2)	(3)	(4)	(5)	(6)
Indicator SP	0.07006***	0.01545	0.00380	0.00119	0.04129***	-0.00040
	[0.00686]	[0.01025]	[0.00239]	[0.00266]	[0.00394]	[0.00377]
Ind. Oportunidades	-0.00196	0.00904	0.00842***	0.00049	0.01414***	-0.00600
	[0.00526]	[0.02822]	[0.00217]	[0.00346]	[0.00306]	[0.00499]
Schooling		-0.04002***	-0.01113***	-0.02802***		
		[0.00094]		[0.00061]		[0.00101]
Age		-0.02567***	0.01121***	-0.00798***		
		[0.00096]		[0.00041]		[0.00070]
Age^2		0.00027***	-0.00005***	0.00013***		
		[0.00001]		[0.00001]		[0.00001]
Male		-0.04863***	-0.02394***	-0.09923***		
		[0.00683]		[0.00531]		[0.00630]
Married		-0.06267***	0.01704***	-0.00031		
		[0.00317]		[0.00201]		[0.00238]
Children		0.00309***	0.00126***	0.00162***		
		[0.00036]		[0.00015]		[0.00035]
Electricity Growth[1/]		-0.00006		-0.00005***	-0.00005***	
		[0.00005]		[0.00001]		[0.00002]
Constant	0.44102***	1.16949***	0.20802***	-0.20899***	0.50011***	0.46142***
	[0.00400]	[0.03053]	[0.00099]	[0.01110]	[0.00189]	[0.01910]
Sector FE	NO	YES	NO	YES	NO	YES
Yea FE	NO	YES	NO	YES	NO	YES
Observations	424227	361940	609990	519115	604540	514329
Number of mn	350	318	350	318	350	318
R-squared	0.004	0.156	0.000	0.115	0.002	0.149

* significant at 10%; ** significant at 5%; *** significant at 1%
Standard errors clustered by municipio

Notes: 1/Taken as a proxy for economic activity in the municipio

Source: Authors' estimations using ENE (1995-2004) and ENOE (2005-2009)

Table 5: Transition Probabilities Among Formality, Informality and Non-employment

COEFFICIENT	(1) Transition Formal to Informal	(2) Transition Formal to Informal	(3) Transition Non-Employed to Informal	(4) Transition Non-Employed to Informal	(5) Transition Informal to Formal	(6) Transition Informal to Formal	(7) Transition Non-Employed to Formal	(8) Transition Non-Employed to Formal
Ind. SP	0.00306	0.00240	0.00565*	0.00194	-0.00144	-0.00323	-0.00002	-0.00187
	[0.00435]	[0.00442]	[0.00320]	[0.00192]	[0.00270]	[0.00308]	[0.00253]	[0.00190]
Schooling		-0.00947***		-0.01756***		0.00433***		0.01749***
		[0.00060]		[0.00055]		[0.00024]		[0.00055]
Age		-0.00779***		-0.00378***		-0.00135***		0.00372***
		[0.00084]		[0.00022]		[0.00029]		[0.00022]
Age^2		0.00008***		0.00005***		0.00000		-0.00005***
		[0.00001]		[0.00000]		[0.00000]		[0.00000]
Male		0.01276***		-0.03401***		0.01883***		0.03371***
		[0.00288]		[0.00244]		[0.00191]		[0.00246]
Married		-0.02601***		-0.00364***		-0.00953***		0.00374***
		[0.00224]		[0.00113]		[0.00153]		[0.00109]
Children		0.00035***		0.00032***		-0.00007		-0.00032***
		[0.00011]		[0.00009]		[0.00009]		[0.00009]
Electricity Growth[1/]		0.00065*		-0.00027**		-0.00035**		0.00025**
		[0.00036]		[0.00011]		[0.00015]		[0.00011]
Constant	0.11234***	0.16448***	0.16961***	0.04960***	0.08579***	0.04744***	0.10988***	-0.04812***
	[0.00257]	[0.01603]	[0.00196]	[0.00363]	[0.00184]	[0.00569]	[0.00216]	[0.00370]
Economic Sector FE	NO	YES	NO	YES	NO	YES	NO	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES
Observations	158744	142488	568140	508924	240526	215899	568140	508924
Number of mn	332	302	332	304	332	303	332	304
R-squared	0.000	0.094	0.014	0.663	0.001	0.050	0.022	0.346

Robust standard errors in brackets

*** p<0.01, ** p<0.05, * p<0.1

[1/] Used as a proxy for economic growth in the municipio

Table 6: Wage Differentials from Switching Jobs between Formal and Informal Sectors

COEFFICIENT	(1) Change Wage Formal to Informal	(2) Change Wage Formal to Informal	(3) Change Wage Informal to Formal	(4) Change Wage Informal to Formal
Ind. SP	-0.01178	-0.01598	-0.01218	-0.01022
	[0.01434]	[0.01566]	[0.01917]	[0.01961]
Schooling		-0.00176		-0.00590**
		[0.00224]		[0.00247]
Age		0.00408*		-0.00626***
		[0.00240]		[0.00194]
Age^2		-0.00006*		0.00007**
		[0.00003]		[0.00003]
Male		0.02129		-0.03414***
		[0.01555]		[0.01034]
Married		0.01109		-0.06012***
		[0.01030]		[0.01102]
Children		-0.00025		0.00080
		[0.00056]		[0.00053]
Electricity Growth [1/]		-0.00054		-0.00483**
		[0.00115]		[0.00193]
Constant	-0.00632	-0.07137*	0.02050*	0.26374***
	[0.01200]	[0.04210]	[0.01242]	[0.04660]
Economic Sector FE	NO	YES	NO	YES
Year FE	YES	YES	YES	YES
Observations	14668	13279	15085	13700
Number of mn	300	266	307	274
R-squared	0.001	0.004	0.000	0.008

Robust standard errors in brackets

*** p<0.01, ** p<0.05, * p<0.1

[1/] Used as a proxy for economic growth in the municipio

Table 7: Endogeneity Analysis. Informality as Predictor of Year of Introduction of Seguro Popular. Analysis by Municipio

VARIABLES	(1) Year SP	(2) Year SP	(3) Year SP	(4) Year SP	(5) Year SP	(6) Year SP	(7) Year SP > 50 K
NHSE	1.22354*	0.22439	1.00588	0.96272	0.34993	-0.39310	-1.16360
	[0.67410]	[0.63856]	[0.77338]	[0.77728]	[0.98941]	[0.79340]	[0.97791]
Log Total Pop Mun				-0.35480	-0.08851	-0.22394	-0.30039
				[0.24128]	[0.21337]	[0.19960]	[0.22886]
Log Doctors Mun			-0.20832*	0.04417	-0.07278	-0.28431*	-0.34948*
			[0.11156]	[0.15922]	[0.17812]	[0.16023]	[0.19100]
Log Hospitals Mun			0.19684	0.10258	-0.06081	0.50087***	0.54781***
			[0.15269]	[0.18612]	[0.16258]	[0.18857]	[0.20924]
% Illiteracy					7.02912	4.95647	4.75101
					[4.29446]	[4.36542]	[4.80637]
% No Electricity					-3.67638	-5.19720	-9.33081**
					[3.94948]	[3.31660]	[3.79114]
% Overcrowded					-1.31852	-2.06111	-3.52311*
					[1.90588]	[1.68236]	[1.90463]
% Earning < 2 min. w.					1.61811	-2.52218	-4.68254**
					[1.49338]	[1.79785]	[2.06832]
Log GDP pc					0.42570	0.32477	0.13904
					[0.39531]	[0.38538]	[0.42278]
Life Expectancy					12.29459	-8.94261	-20.65739
					[9.77210]	[11.69278]	[13.76329]
% Males					-5.24521*	-6.24904***	-6.11124**
					[3.05376]	[2.34660]	[2.77206]
Age					0.04427	-0.03132	-0.05241
					[0.06253]	[0.04688]	[0.05310]
Years Schooling					-0.04030	0.04125	0.01185
					[0.12022]	[0.09360]	[0.11336]
Log Population State			0.57950***	-0.17790			
			[0.15255]	[0.47061]			
Governor PAN			0.24827	0.60613**			
			[0.26835]	[0.28766]			
Governor PRD			-0.36604	-0.01262			
			[0.37849]	[0.40655]			
Log Doctors State				1.02882*			
				[0.53699]			
Log Hospitals State				0.25323			
				[0.20125]			
Constant	1.07577***	1.62538***	-6.8652***	-2.40142	-10.54863	15.16710	30.90268**
	[0.38515]	[0.35959]	[2.29201]	[2.67952]	[8.77009]	[11.52445]	[13.33793]
State FE	NO	YES	NO	NO	NO	YES	YES
Observations	211	211	192	192	192	192	164
R-squared	0.016	0.539	0.116	0.178	0.098	0.625	0.648

Standard errors in brackets

*** p<0.01, ** p<0.05, * p<0.1

Table 8: Endogeneity Analysis. Informality as Predictor of Year of Introduction of Seguro Popular. Analysis by State

VARIABLES	(1) Year SP	(2) Year SP	(3) Year SP	(4) Year SP	(5) Year SP
NHSE	-3.49242	-3.53483	-3.23001	-3.60693	-3.52439
	[2.09660]	[2.16688]	[2.34640]	[2.69223]	[7.72346]
Log Total Population		0.02872	0.01220	-0.82202	-0.71911
		[0.25756]	[0.26795]	[0.80403]	[1.15862]
Governor PAN			-0.21029	0.27304	0.50537
			[0.47684]	[0.56902]	[0.96787]
Governor PRD			-0.25038	-0.08709	-0.02829
			[0.59361]	[0.68976]	[1.14529]
Log Doctors State				0.85454	0.74307
				[1.01841]	[1.37932]
Log Hospitals State				0.58493	0.55831
				[0.42006]	[1.14972]
% Illiterate					-0.08490
					[0.18522]
% No Electricity					-0.17957
					[0.16842]
% Overcrowded					0.02082
					[0.12810]
% Earning < 2 min. wages					0.01345
					[0.07490]
Life Expectancy					-40.35029
					[77.25304]
Log GDP pc					0.84578
					[2.13059]
Gender					-4.62994
					[53.29327]
Age					0.47940
					[0.67856]
Schooling					0.20826
					[1.06279]
Constant	2,004.51987***	2,004.12281***	2,004.30312***	2,006.30205***	2,017.09911***
	[1.08430]	[3.72818]	[3.86181]	[4.77025]	[72.57447]
Observations	31	31	31	29	29
R-squared	0.087	0.088	0.098	0.181	0.277

Standard errors in brackets

*** p<0.01, ** p<0.05, * p<0.1

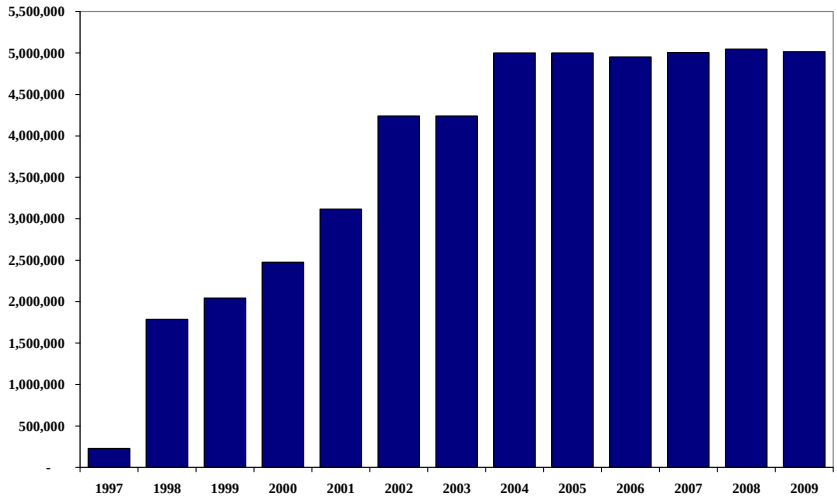
Table 9: Current benefits of Oportunidades by School Level

School Level	Grant Boys	Grant Girls		Max. Food + School Per Household
Elementary	3	$12.00		$110
	4	$14.00		
	5	$18.00		
	6	$24.00		
Secondary	7	$35.00	$37.00	
	8	$37.00	$41.00	
	9	$39.00	$45.00	
High School	1	$58.50	$67.50	$185
	2	$63.00	$71.50	
	3	$66.50	$76.00	

Source: Coordinacion Nacional de Oportunidades

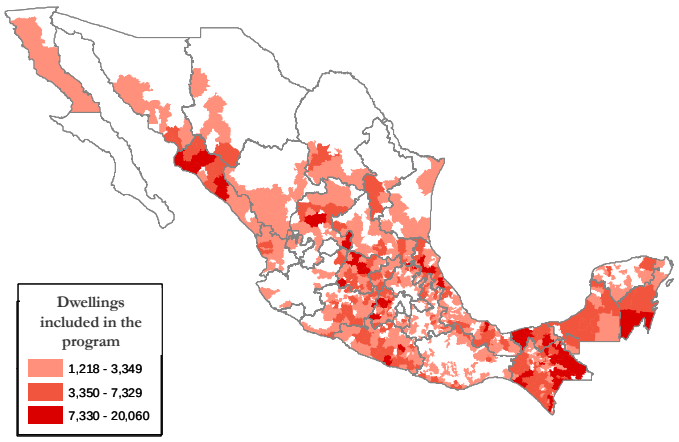
Exchange rate: 11 pesos per USD.

Figure 2: Total dwellings covered by Progresa-Oportunidades by year



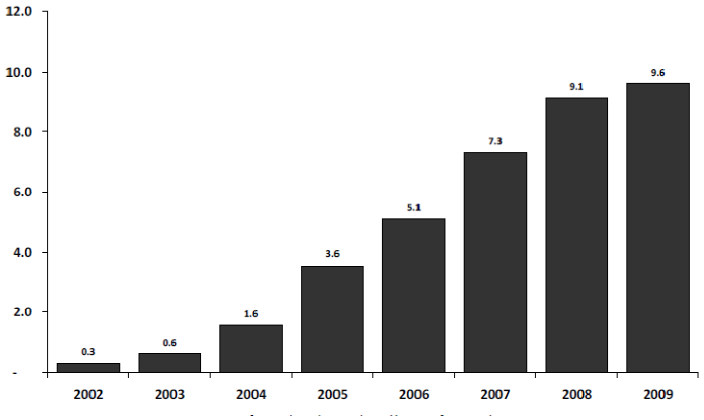
Source: Coordinacion Nacioanal de Oportunidades

Figure 3: Geographical Coverage of *Oportunidades* in 2009



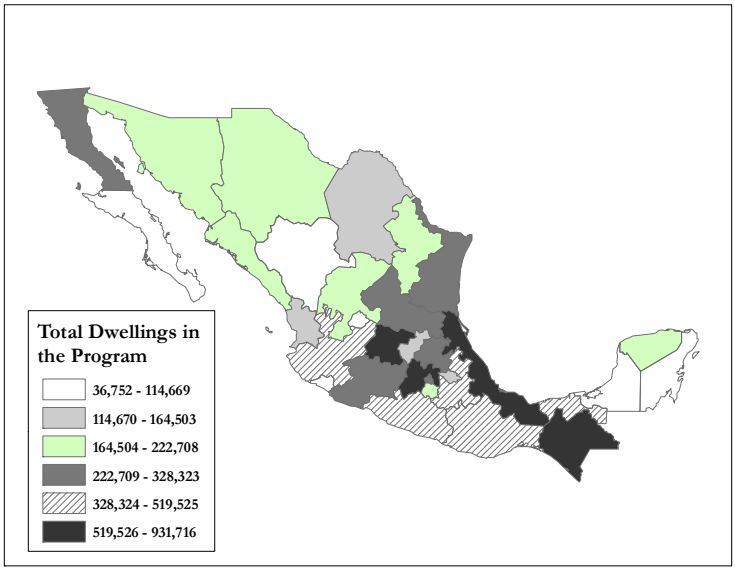
Source: Coordinacion Nacioanal de Oportunidades

Figure 4: Total Dwellings Covered *Seguro Popular* by Year (Millions)



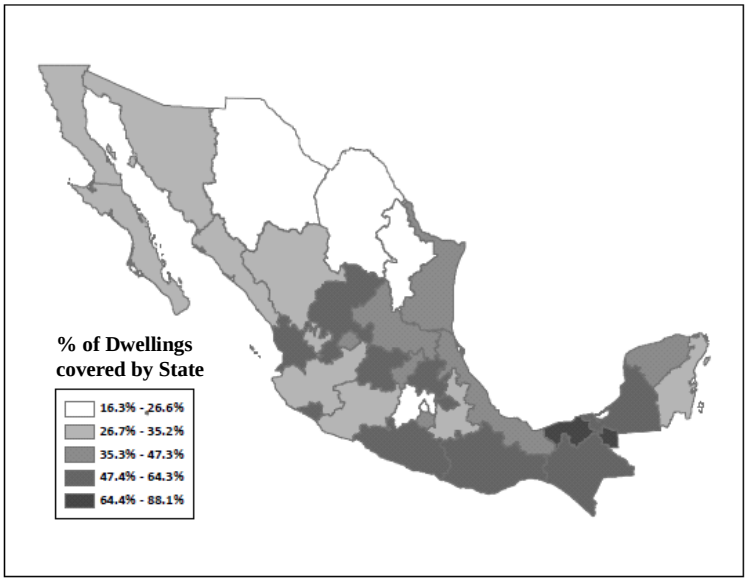
Source: CNPSS (2009)

Figure 5: Geographical Coverage of *Seguro Popular* in 2009



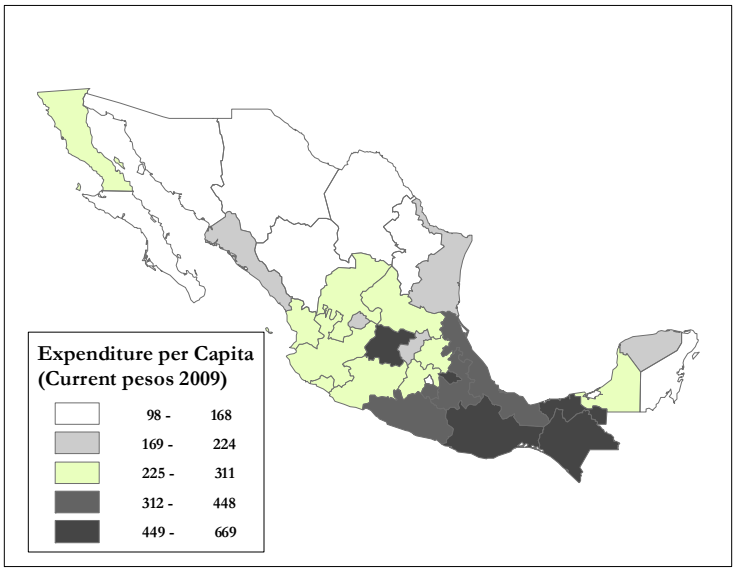
Source: CNPSS (2009)

Figure 6: Geographical Coverage of *Seguro Popular* in 2009, in % of the population



Source: CNPSS (2009)

Figure 7: Variation of Expenditure of *Seguro Popular* by State, 2009



Source: CNPSS (2009)