

The Short Term Causal Effects of Seguro Popular on Formal Employment

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Motivation

- **There is a concern regarding whether the introduction of publicly subsidized health insurance programs may reduce the already small formal labor markets (see Levy 2008).**
- **While fears have strong theoretical support, see for example Marrufo (2002), there is still limited empirical evidence.**
- **Barros (2009) using survey data at the household level and a DD approach at the state level does not find impact on labor supply nor on informality. Duval and Smith (2011) find that Seguro Popular reduced the probability of looking for a formal sector job,**
- **Bosch and Campos-Vásquez (2010); Azuara and Marinescu (2010); and Aterido, Hallward-Driemeier and Carmen Pages (2011) using the fact that the Program was rolled over gradually at the municipality level estimate the effect of the program. The first two uses administrative data and find opposite conclusions. The last one uses employment surveys and find important effects.**

Objective

- This paper provides evidence of the causal effect of the *Seguro Popular* on formal employment and probabilities of leaving or joining a formal job
- It takes advantage of the randomized experiment implemented for the evaluation of the impact of the *Seguro Popular* on health related indicators and out of the pocket spending and by using an administrative database that records longitudinal individual level information of workers participation in formal labor markets.

The Seguro Popular (1/2)

The Mexican health care system was reformed in 2004 to introduce the Sistema de Protección Social en Salud (SPSS), also known as the *Seguro Popular*.

The *Seguro Popular* is an insurance scheme that entitles enrollees access to medical and surgical services, as well as drugs and hospitalization, free of cost at the point of service, i.e., there are no copayments. The interventions listed represent 95% of the disease burden in Mexico (King 2007).

The only requirement to be affiliated to the *Seguro Popular* is that persons should not be affiliated to any health insurance provided by social security agencies, the Mexican Institute of Social Security (IMSS), which is the scheme for workers of private companies, or the social security agencies (ISSSTE) for workers of public entities (federal and state workers).

The Seguro Popular (2/2)

- **Total funding to *Seguro Popular* (federal and state contributions) imply roughly that per household spending in the *Seguro Popular* equals approximately 690 dollars per year.**
- **Given that fact that 97 per cent of the affiliates are registered in the non contributive regime (*Seguro Popular* 2010), basically this program is free.**
- **Total funding from contributions to IMSS equals approximately 600 dollars per year per family to provide health insurance. IMSS spending in health though equals approximately 880 dollars, the difference being financed by the use of reserves (IMSS 2010).**
- **All employers have to paid contributions for pensions, health and social services, with out the possibility of paying for just one insurance or the other. This means that globally payroll contributions (employee and employer) in IMSS equal approximately 25% of taxable wages (Frías 2006).**

The randomized experiment of *Seguro Popular* (1/4)

In 2005-2006 it was implemented a randomized experiment to evaluate the effect of the *Seguro Popular* in individual health, financial protection and system effective coverage.

Health clusters were defined as the unit of intervention, and aggregate (at health cluster level) and individual results were provided. A health cluster consist of a health unit and the population which correspond to it.

- Different health clusters within the same participant states were matched and one of them was randomly chosen to receive the intervention while the other remained as the control health cluster. In total 100 health clusters participated in the study.**

- The treatment was defined as “encouragement to affiliate to Seguro Popular” across health clusters, which means that authorities in participating states during the period of September 2005 to April 2006 encouraged affiliation, via several forms of advertising, in the catchement areas of the treated health clusters but not in controls. Important to mentions is that no restrictions were place to any individual to affiliate at any time.**

The randomized experiment of *Seguro Popular* (2/4)

To measure outcomes, a survey to 38,000 households was applied in August- September of 2005 (baseline) and in June-July 2006 (follow up).

The survey includes several questions regarding demographic and social. For our topic of interest, the survey includes four questions regarding the family members affiliation status: a question that specifically ask to each member of the household “whether he is covered by a mandatory health insurance plan”; whether he is the direct beneficiary, or indirect beneficiary, or whether he has a voluntary health plan, such as Seguro Popular and IMSS Oportunidades. Regarding occupational status interviewed were asked where they work, which has been the main occupation in the last 12 months and why he/she is not receiving a salary if in a previous questions answered she/he works without a wage. Wages were not asked.

It would give an estimate of the impact of the treatment in the formal employment by comparing the before and after answer to the question regarding affiliation. Unfortunately, in the baseline this question has approximately 70% of missing observations.

The randomized experiment of *Seguro Popular* (3/4)

Table 1
Covariates used in the matching process

Covariate	Rural	Urban
Total population	Yes	Yes
Average education	Yes	Yes
Average room per occupant	Yes	Yes
Percent female	Yes	Yes
Percent between 0 and 4 years old	Yes	Yes
Percent under 18	Yes	Yes
Percent with and without social security rights	Yes	Yes
Percent over 5 who where living in the locality on both 1995 and 2000	Yes	
Percent disabled	Yes	Yes
Percent over 15 and illiterate	Yes	Yes
Percent married	Yes	Yes
Percent catholic	Yes	Yes
Percent employed	Yes	Yes
Percent employed in the primary/secondary/tertiary sector ^{1/}	Yes	Yes
Percent living in households making less than 2 minimum wages	Yes	Yes
Percent of households headed by women	Yes	Yes
Percent over 5 speaking and indigenous language	Yes	
Weighted marginalization index	Yes	Yes
Infrastructure variables (beds, doctors offices, physicians, and nurses ^{2/}	Yes	Yes
Dummy of affiliation of the health center to Seguro Popular	Yes	
Population within 1km without social security	Yes	
Housing infrastructure variables (condition of the walls, roof, plumbing, electricity, and refrigerator	Yes	Yes
Percent in Oportunidades	Yes	Yes
Index comprising the sum of a series of health infrastructure variables describing the health units within 120 minutes of the cluster ^{3/}	Yes	
Percent over 60		Yes
Percent over 65		Yes
Percent in IMSS		Yes
Percent living in the AGEb in both 2005 and 2000		Yes
Altitude		Yes

Notes: 1/ For the urban clusters only secondary and tertiary sectors; 2/ For the urban case it includes operating rooms. 3/ Of these, four were partially unobserved, and were imputed.

The randomized experiment of *Seguro Popular* (4/4)

Table II

Percentage of persons reported to be affiliated to *Seguro Popular*

	Treatment	Control	Difference
Baseline	0.131 (0.338)	0.035 (0.183)	-0.096***
Follow up	0.451 (0.497)	0.071 (0.258)	-0.379***

*** Statistically significant at 1%.

The databases (1/2)

The most important database used in this paper is the social security administrative database of the *Sistema de Ahorro para el Retiro* (BDSAR).

The data base covers the August 1997-February 2006 period. This data base contains individual information of persons registered to the *Sistema de Ahorro para el Retiro* (SAR). It includes all workers that participate or have participated in the formal sector in Mexico. The administrative records contain more than 36 millions of registries.

- The data contains information on age, sex, employer, PFM that manages the account, investment fund chosen by the affiliate, wage and address of affiliate (in the last update, close to 2006). It has also information on the housing program and whether the worker has retired. It registers every two months the wage and contributions made to the worker's account, so number of formal workers, or records of joining or leaving the formal sector can be easily calculated.**

- The second piece of information is the one from the randomized experiment. From the database I obtained the identification code of each of the health units used to construct the health clusters. With this information I found, using available official data, the addresses of each unit and, with information from the database of the Mexican mailing system, I identify the zip code where each health unit is localized. I then identify all workers in the BDSAR who live in the same zip code.**

- Out of 100 health clusters, only 62 register formal employment: 52 rural and 10 urban**

The databases (2/2)

My database is thus all persons who have or had had an account in the formal employment since 1997 who live in the same zip code of the treatment and control health units that register having at least one formal worker in the period. We are not using the notion of health cluster since it was artificially created for the project using the geographical definition of AGEB, which does not have a direct relationship to zip codes. The zip code, nevertheless, defines a smaller geographical area than a health cluster.

My baseline is 2005.04

Empirical strategy and results: zip code level

I will compare outcomes of interest in treatment and control areas before and after the implementation of the intervention.

I consider stratified 10 urban clusters (5 treatment and 5 control): 52% of records in the database; and 51 rural clusters (26 treatment and 25 controls).

Under the assumption that in the absence of the intervention changes in labor market outcomes would not have been different in treatment and control areas, the difference in difference of these two groups can be interpreted as the causal effect of the program.

Empirical strategy: zip code level

	Full sample		
	Treatment (1)	Control (2)	Difference (1) - (2)
Formal employment at baseline	2,728	1,490	1,237
	(2,460)	(1,241)	(2,755)
Formal employment 2005.05	2,663	1,450	1,213
	(2,401)	(1,210)	(2,689)
Difference	-64.40	-40.00	-24.40
	(3,438)	(1,733)	(66.7)
Formal employment 2005.06	2,614	1,428	1,186
	(2,357)	(1,193)	(2,642)
Difference	-113.60	-62.20	-51.40
	(3,407)	(1,722)	(113.8)
Formal employment 2006.01	2,530	1,384	1,147
	(2,282)	(1,157)	(2,559)
Difference	-197.20	-106.60	-90.60
	(3,3556)	(1,697.)	(196.6)
Average age	44.37	39.61	4.76
	(5.9)	(1.1)	(6.0)
Wages ^{1/}	1.22	1.52	-0.29
	(0.332)	(0.177)	(0.376)
Proportion of men	0.78	0.64	0.14*
	(0.092)	(0.020)	(0.094)
Density of contributions	57.73	43.90	13.83
	(9.815)	(5.017)	(11.022)

Empirical strategy: zip code level

$$Y_{kt} = \alpha + X\beta + \delta_1 \textit{treat} + \delta_2 \textit{period}_{2006.01} + \delta_3 (\textit{treat} \times \textit{period}_{2006.01}) + v_{kt}$$

Y_{kt} is the number of formal employees at time t of cluster k .

treat is a dummy variable indicating that the cluster belongs to the treatment group

period is a dummy variable indicating that the observation belongs to the 2006.01 period.

The parameter of interest is delta 3 , which measures the difference in difference effect of *Seguro Popular* on the outcomes of interest.

X are control variables: average age, average wage, proportion of men and average density of contribution.

Results: zip code level, urban

Treatment*time	-90.60	-226.13
	(3760.382)	(3369.416)
Treatment	1,237.40	4,625.27
	(2755.431)	(3118.904)
Time	-106.60	201.95
	(1697.016)	(2406.815)
Age		397.89
		(267.6956)
Wage		7,570.94
		(6958.536)
Male		-14,057.77
		(16855.72)
Contribution density (last 4 years)		-83.30
		(192.096)
Constant	1,490.20	-13,085.57
	(1241.054)	(19893.32)
R-squared	0.02	0.41
Obs	20	20

Note: Standard errors in parenthesis. ***p<0.01, **p<0.05, *p<0.1

Empirical strategy: individual level data full sample under two possibilities

Urban

	Employed at baseline		Not employed at baseline	
	(1)	(2)	(3)	(4)
Treatment	-1.14e-14* (6.38e-15)	0.007*** (0.8935)	-2.35e-14*** (6.08e-15)	-0.003*** (0.0004)
Time	-0.096*** (0.0034)	-0.092*** (0.0033)	0.066*** (0.0025)	0.066*** (0.0024)
Treatment* time	-0.008* (0.0043)	-0.007* (0.0042)	0.008** (0.0031)	0.008** (0.0031)
Age		0.000 (0.0001)		0.001*** (0.00004)
Male		-0.008*** (0.0021)		0.012*** (0.0015)
Wage		0.0140*** (0.0003)		
Contribution density (last 4 years)		0.0001*** (0.0001)		0.001*** (0.00004)
Constant	1.000*** (5.16e-15)	0.894*** (0.0068)	2.10e-14*** (4.84e-14)	0.012*** (0.0020)
R-squared	0.053	0.112	0.037	0.063
Obs	42,178	42,178	60,276	60,276

Empirical strategy: individual level data young women under two possibilities

Urban

	Employed at baseline		Not employed at baseline	
	(1)	(2)	(3)	(4)
Treatment	-4.02e-14*** (1.68e-15)	0.008*** (0.0027)	-1.92e-14*** (1.20e-15)	-0.001 (0.0007)
Time	-0.107*** (0.0094)	-0.100*** (0.0089)	0.066*** (0.0056)	0.066*** (0.0056)
Treatment* time	-0.013 (0.0119)	-0.012 (0.0114)	0.000 (0.0068)	0.000 (0.0067)
Age		-0.003*** (0.0009)		-0.001 (0.0005)
Wage		0.027*** (0.0017)		
Contribution density (last 4 years)		0.000*** (0.0001)		0.001*** (0.0001)
Constant	1.000*** (1.13e-15)	0.976*** (0.0287)	2.06e-14*** (8.60e-16)	0.008 (0.0162)
R-squared	0.062	0.146	0.034	0.049
Obs	6,268	6,268	12,348	12,348

Results: zip code level, rural

	(1)	(2)
Treatment*time	36.99 (600.585)	38.14 (606.044)
Treatment	-539.26 (440.636)	-626.16 (474.848)
Time	-43.80 (596.962)	-47.02 (598.876)
Age		10.08 (7.203)
Wage		-78.18 (65.167)
Male		-377.39 (257.587)
Contbution density (last 4 years)		9.84 (6.024)
Constant	627.64 (437.957)	295.20 (467.792)
R-squared	0.03	0.05
Obs	102	102

Note: Standard errors in parenthesis. ***p<0.01, **p<0.05, *p<0.1

Empirical strategy: individual level data full sample under two possibilities

Rural

	Employed at baseline		Not employed at baseline	
	(1)	(2)	(3)	(4)
Treatment	-3.04e-14*** (1.57e-15)	0.000 (0.001)	4.16e-14*** (1.33e-15)	0.000 (0.0003)
Time	-0.097*** (.002)	-0.094*** (0.002)	0.060*** (0.001)	0.052*** 0.001
Treatment*time	-0.007 (.007)	-0.006 (0.007)	-0.009*** (0.004)	-0.007** 0.003
Age		0.000 (0.0001)		-0.001*** 0.000
Male		-0.012*** (0.002)		0.006*** 0.001
Wage		0.009*** (0.0002)		0.179*** 0.020
Contribution density (last 4 years)		0.0001*** (0.00008)		0.001*** 0.000
Constant	1.000*** (5.14e-16)	0.893*** (0.008)	6.21e-15*** (5.26e-16)	0.010*** (0.002)
R-squared	0.05	0.10	0.03	0.18
Obs	35,978	35,978	58,814	58,814

Robustness check: urban zip code level

	Treatment	Control	Difference
Experiment of interest			
2005.04	2,728	1,490.20	1,237.40
	(2,460)	(1,241)	(2,755)
2006.01	2,530	1,384	1,147
	(2,282)	(1,157)	(2,559)
Difference	-197.20	-106.60	-90.60
	(3,356)	(1,697)	(196.6)
Panel A			
2005.01	3,058	1,636	1,422
	(2,753)	(1,363)	(3,072)
2005.04	2,728	1,490	1,237
	(2,460)	(1,241)	(2,755)
Difference	-330.40	-145.80	-184.60
	(3,692)	(1,844)	(317.3)
Panel B			
2003.03	3,045	1,682	1,363
	(2,742)	(1,399)	(3,078)
2003.06	3,105	1,685	1,421
	(2,798)	(1,406)	(3,132)
Difference	60.20	2.60	57.60
	(3,918)	(1,983)	(57.0)

Conclusions

Using the randomized experiment of the *Seguro Popular* and administrative longitudinal data at the individual level of participation in formal labor markets, I found no effects of *Seguro Popular* on formal employment, nor on the probability of joining or leaving the formal sector

it is contrary to the predictions of some views of some theoretical models. What possible explanation is there for this contradiction?

People have a long-term (implicit) contract with their healthcare provider: effects should be seen in the long run

Even in the long run, if individuals perceive that services provided under *Seguro Popular* are not of good quality, they may prefer to stay in the formal sector and have access to the IMSS healthcare services, as argued by Barros (2009)

Seguro Popular and IMSS are complementary: *Seguro Popular* for first and secondary care and IMSS for tertiary care

Another possibility is that workers affiliated with IMSS value other benefits of the scheme, such as the pensions — retirement, disability or work risk — maternity benefits, or the possibility to get a mortgage, and thus, are willing to stay in the formal employment despite the possibility to affiliate with *Seguro Popular* at no cost.