Mexico's System for Social Protection in Health and the Formal Sector

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Abbreviations and Acronyms

CEDLAS	Socio-economic Database for Latin America and the Caribbean (*Base de datos socio-económicos para América Latina y el Caribe*)
ENCELURB	Urban Household Evaluation Survey
ENE	National Survey of Employment
ENIGH	Mexican National Survey of Income and Expenditures
ENOE	National Survey of Occupation and Employment
IMSS	Mexican Institute for Social Insurance (*Instituto Mexicano para Seguro Social*)
ISSSTE	Institute of Social Security and Services for Government Workers (*Instituto de Seguridad y Servicios Sociales de los Trabajadores del Estado*)
MxFLS	Mexican Family Life Survey
NHCS	National Health System (*Sistema Nacional de Salud*)
SAT	Tax Administration Service
SEDESOL	Social Development Secretariat (*Secretaría de Desarollo Social*)
SP	Social Insurance (*Seguro Popular*)
SPSS	System of Social Protection in Health (*Sistema de Protección Social en Salud*)
SSL	Social Security Law (*Ley de Seguridad Social*)

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A. Introduction

1.   As in many low- and middle-income countries, Mexico's health system is fragmented into different sub-systems with access linked to labor market status. Social security schemes provide health care for formal sector workers and their dependents, while Mexico's System for Social Protection in Health (SPSS), better known as its pilot and main pillar *Seguro Popular*, offers health care to the rest of the population.

2.   The SPSS was introduced in 2003 to reduce the substantial inequalities in health and financial protection between Mexicans who have and do not have social security. It gradually replaced the country's national care health system (NHCS), increasing the availability of public funding, guaranteeing access to explicitly-defined services and making them free at the point of use.

3.   It had been thought that offering services similar to those of social security at lower costs, the SPSS might reduce enrollment in social security and thus labor force participation in the formal sector.   Such an effect could have major welfare consequences, from reducing the number of Mexicans enjoying comprehensive social protection (in addition to health care), to weakening the tax-base and dampening economic growth.

4.   In response to these concerns, researchers conducted more a dozen studies over the past four years**,** drawing on various data sets and methodologies. This paper reviews the body of evidence and offers conclusions for policy making.

5.   The literature review has been carried out in collaboration with the Mexico's National Commission on Social Protection in Health and the Federal Ministry of Health. It is part of a series of World Bank research pieces that intends to provide new insights into the many successes of Mexico's 2003 health sector reform, but also the remaining challenges facing the health system serving Mexicans without social security.

6.   Following this introduction, the paper provides background information, reviews the studies' data and methods and their key findings, discusses them and closes with conclusions for policy-making.

B. Background

7.   As in many low and middle-income countries, Mexico's health system is fragmented into two major sub-systems with access linked to labor market status. The social security system is mandatory for workers in the formal sector. It includes several schemes, the largest of these being the Mexican Institute for Social Insurance (*Instituto Mexicano del Seguro Social),* or IMSS, which covers approximately 40% of the population and to which affiliation is mandatory for salaried workers. The second largest is the Mexican Institute for Social Security and Services of Government Workers (*Instituto de Seguridad y Servicios Sociales para Trabajadores del Estado*), or ISSSTE, which covers approximately 9% of the population. Both IMSS and ISSSTE obtain their funds from employer, employee and government contributions. Benefits include comprehensive medical care that is generally free at the time are provided for members and their immediate dependents; such benefits are part of a broader package that includes sick and maternity leave, compensation for injuries, disabilities and death related to work, old-age insurance, day care, access to recreational facilities and low-interest housing loans.

8.   The second sub-system is available to Mexicans who do not have social security. It includes several schemes and programs, the largest of these being the System for Social Protection in Health—SPSS—(*Sistema de Protección Social en Salud*). It was introduced in 2003 and has gradually replaced the NHCS. As it has expanded over the years, it has transformed the financing and access to health benefits for Mexicans without social security. First, it replaced federal/state-based budgets with per capita allocations to increase public financing and thus ensure that resources are adequate to finance an explicitly defined, comprehensive package of primary and secondary and selected tertiary health care services. Second, it replaced a system that included user fees with one based on a sliding scale that exempts the poorest beneficiaries from having to contribute. It should be noted, however, that the beneficiary contributions are generally not collected. Enrollment in SPSS is voluntary and provided to families, which also includes workers' parents.

9.   The roll out of the SPSS was rapid, from a pilot in 2002 to covering more than 95% of Mexicans without social security ten years later. It followed different rules and practices at the state, municipal and individual level. Participation of states and the Federal District (FD) was voluntary. Five states agreed to participate in the pilot, all others joined between 2003 and 2005 and the FD in 2007. Agreements between the federal government and states and the FD set forth quarterly affiliation targets. As part of the pilot, individual municipalities in 14 states participated prior to formal state agreements. Rules governing the local role out required states to give priority to poorest regions with minimum infrastructure requirements. In practice, some smaller states enrolled early across the entire territory, eventually to declare state-wide implementation prior to presidential elections in 2006 (Diaz-Cayeros et al (2006)). Participation agreements set forth affiliation targets to ensure priority access for the

poor, highly marginalized populations and small municipalities. As a result, in 2008, about 68% of SPSS households fell under the assets poverty line, compared to 51% of the uninsured population and 23% of social security households (World Bank, Forthcoming). Sub-schemes targeted children (*Seguro Médico para una Nueva Generación*), pregnant women (*Embarazo Saludable*) and individuals suffering from severe diseases (*Fondo de Gastos Catastrophicos*). As a result, approximately 66% of SPSS households reported the recent illness of a member compared to 53% of the uninsured households and 57% of social security (World Bank, Forthcoming).

10.   The SPSS significantly narrowed the gap between the public financing of health care for those with and without social security and improved their financial protection, access and use of health services. In 2009, SPSS financing rules resulted in an increment in the funds available for health care of Mexicans without social security of 0.5% of GDP and the ratio of per-capita health expenditures for Mexicans with and without social security had dropped from 2.2 in 2000 to 1.5 in 2009 (World Bank, Forthcoming). Members of the SPSS had lower out-of-pocket expenditures than Mexican's without any form of financial protection and the incidence of catastrophic expenditures among them was similar to the incidence among members of social security. Members of the SPSS also saw small improvements above and beyond high levels of access and utilization of health care services and more significant improvements in the access to medicines. Municipalities with SPSS enjoyed three years after its implementation higher ratios of health personnel, but not necessarily of health infrastructure. An effect of these improvements on health outcomes, however, has yet to be demonstrated[1].

11.   Since its creation in the 1940s, the NHCS offered an alternative to the IMSS; however, the SPSS offers health benefits beyond those of the NHCS, and closer to those of the IMSS. As such, it had been thought that the SPSS might reduce enrollment in the traditional social security system and, as a result, the number of those employed in the formal sector (Levy 2008); specifically, that the SPSS could motivate (a) formal sector workers to choose informal employment so as to access the SPSS because health benefits would be free and they would no longer have to contribute to other benefits; and (b) workers in the informal sector to remain there, instead of seeking employment in the formal sector. In addition, the SPSS could motivate formal and informal workers to choose not to work and, in turn, individuals that decided not to work to sustain their status.

12.   Following this analysis, it is thought the SPSS could affect social security and formal sector work, which would have major welfare consequences. First, it would threaten the financial viability of the SPSS, since its target population would increase.

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[1] The paragraph is based on: Frenk (2006), Gakidou et al (2006), Galarraga et al (2008), Garrido-Latorre et al, Gonzale-Pier et al (2006), Harris & Sosa-Rubi (2009), Hernandez-Torres et al (2008), King et al (2007), King et al (2009), Knaul et al (2005), Knaul et al (2006), Sepulveda et al (2006), Sosa-Rubi et al (2009), Urbina (2008), and World Bank (Forthcoming).

Moreover, it would weaken the tax-base and thus the government's capacity to finance social services. Also, it would reduce the number of Mexicans enjoying comprehensive social protection, since social security, as mentioned earlier, also provides old-age and disability insurance. Finally, it would reduce economic growth and job creation, since (a) formal firms, whose numbers might decrease, tend to be more productive (because of their larger size) and have greater growth potential (because of their better access to services and markets) and (b) it could create unfair competition from informal firms which could slow the process of *creative* destruction (i.e., the process by which inefficient firms are replaced by more efficient competitors) and impede formal firms' investments in innovation and technology (Perry & Maloney, 2007, Levy 2008).

13.   However, the size of such an effect would depend on the degree to which the Mexican labor market is integrated. In a strictly segmented labor market, wages in the formal sector are significantly higher than the market price and more workers seek employment there than the number of jobs available. In addition, burdensome entry regulations may prohibit small firms from becoming formal. In such a scenario, transitions between labor market segments are rare and additional health benefits for workers in the informal sector are unlikely to be sufficient to have an effect on the level of employment in the formal sector. But Mexico has a more integrated and competitive labor market, and workers choose more freely between formal and informal jobs. Transitions are frequent and even in times of growth and formal job creation, the number of workers who leave the formal sector to become informal has at times exceeded the number of those who move from the informal to the formal sector (Gong 2004, Bosch and Maloney 2006). As such, the SPSS might effectively lower workers' incentives to seek formal employment. This effect may be especially important for workers who are less likely to work in the formal sector, such as those who are younger, less educated, live in rural areas, are married with children, and heads of larger households (Perry and Maloney, 2007). Likewise, the SPSS might effectively lower incentives for firms to register their businesses and enroll their employees in the IMSS, which might be especially true for small firms that are generally less likely to comply with government regulations and more easily evade controls.

14.   The size and duration of such an effect would also depend on potential, secondary wage adjustments. In one scenario, workers increasingly seek and hold onto jobs in the informal sector; as a result, salaries fall in the informal sector and increase in the formal sector. The resulting increase in the gap between informal and formal sector wages would cause more workers to seek employment in the formal sector. In a second scenario, whole firms switch from the formal to informal sector or employers agree with individual employees to change their labor status from formal to informal. Employers and their employees would share the savings in contributions and taxes. The resulting increase in informal sector wages (as employers pass on the

savings to their workers), would attract more workers to this sector—since they would receive higher wages in addition to the SPSS health benefits.

15.   Measuring participation in the formal sector faces the challenge of defining the concept. While the concept can be broadly described as the participation of individuals and organizations in social and governmental institutions, that is, to register legally and pay taxes (Gabrieli, Galvao, & Montes-Rojas, 2011), it is commonly defined in two ways: The *legal* definition is based on labor rights and refers to workers who receive health benefits and/or have the right to old-age pensions depending on their employment and years of work within the formal sector. The *productive* definition describes it as one that includes workers employed in firms with more than five employees, the skilled self-employed, entrepreneurs, and public sector employees (Gasparini & Tornarolli, 2007), (Maloney, 2004).

16.   Moreover, the legal definition is unique to Mexico. The country's labor and social security laws distinguish between salaried and non-salaried workers, and only make social security enrollment mandatory for the former. Salaried workers are those receiving wages in exchange for their labor, while non-salaried workers include the self-employed and those who earn commissions from employers or tips from customers (called *comisionistas*). According to the legal definition, formality is thus defined as salaried work with social security coverage. In turn, informal work is defined as salaried work without social security coverage (called illegal salaried work) and non-salaried work.

17.   Depending on the definitions, trends in formal sector participation vary in Mexico. Based on the productive definition, formal sector participation increased from 47.7% in 1998 to 55.6% in 2010. Based on the legal definition, the findings differ: For example, from 1998-2010, based on access to health benefits, the formal sector was stagnant, remaining at about 34% participation over that period; based on access to pensions, the sector showed only 27% of formal sector workers receiving them in 2010. Such differences—between legal definitions based on those who availed themselves of health benefits and pensions—may result from laws regarding health and pensions. With regard to health, workers obtain benefits while they are employed, while pensions are future benefits—and many are actually unable to obtain them. According to the Social Security Law, only those who have worked in the formal sector for 25 years are eligible for them.[2]

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[2] Article 162 Social Security Law.

**Figure 1. Trends in Formal Sector Participation –
Productive and Legal Definitions**
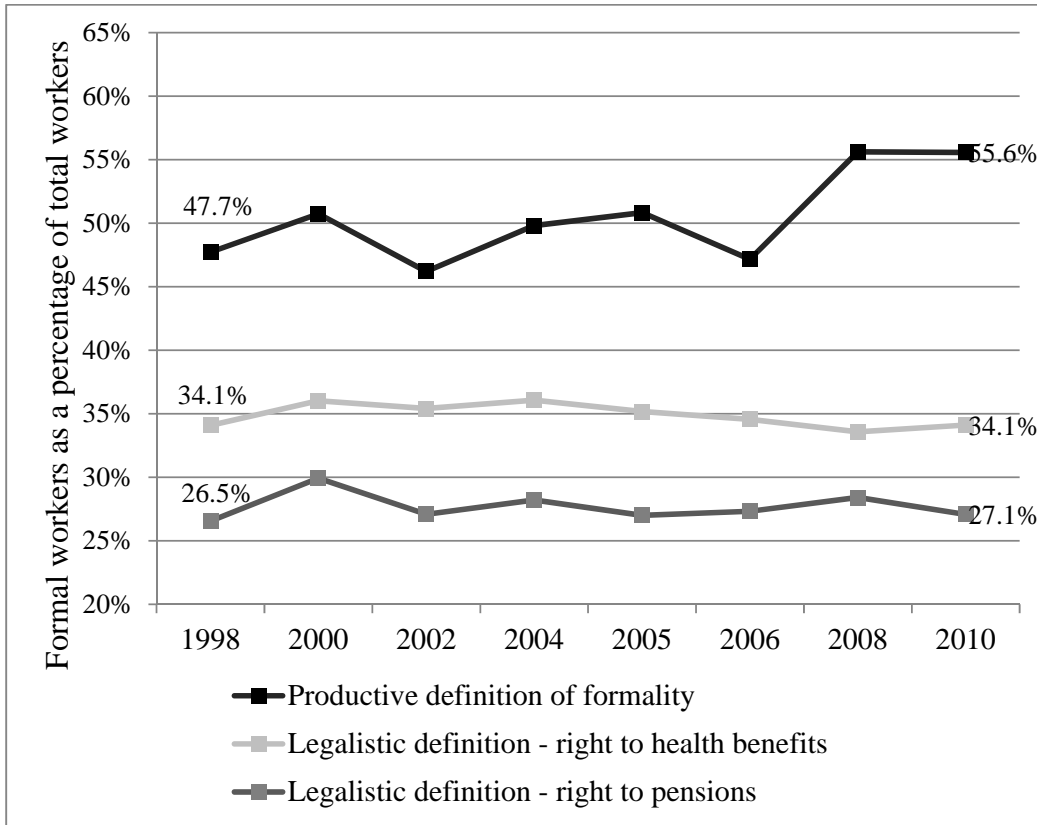
Sources: Base de datos socioeconómicos para América Latina y el Caribe (CEDLAS and World Bank).

Note: Productive definition: Entrepreneurs, public sector workers, salaried workers in large firms and skilled self-employed. Legal definition: salaried workers with the right to health insurance, and salaried workers with the right to pensions.

C. Data and Methods

18.   At the end of 2011, twelve studies had been conducted about the SPSS and enrollment in social security, with the findings presented in ten papers. They included various types of data, adopted a wide range of methodological approaches, described individuals and households enrollment in the SPSS using various geographical units, assessed the effect on the employment in the formal and informal sectors using different definitions, and tested for time-lag effects and other potential problems in their research strategies (endogeneity[3] and unobserved heterogeneity[4]).

19.   Studies drew upon large nationally representative surveys or administrative data-bases as their prime data sources for the outcome variables and most of their determinants, which included cross-sectional[5] data (ENIGH[6], CONTEO[7], ENAMIN[8]), rotating panel (ENE[9]/ENOE[10])[11] and panel data[12] (MxFLS[13]). They also drew on non-nationally representative surveys with panel-data (ENCELURB[14]), and administrative data (from SAT[15] and IMSS). For the intervention variable, that is SPSS enrollment, most of the studies drew on administrative data from the National Commission for Social Protection in Health.

20.   Several studies used data limited to urban areas, males, or micro firms, because of data availability, study objectives and behavioral assumptions.   Five studies restricted their analyses to urban areas: (a) Campos-Vázquez's & Knox's prime data sources (ENE and ENCELURB) were limited to cities and urban municipalities; (b) Azuara & Marinescu assessed both the impact of SPSS and

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[3] Endogeneity occurs when the dependent variable is correlated with the error term. In the studies, for example, endogeneity occurs when the treatment variable (e.g. the introduction of the SPSS) is associated with the outcome of interest – the level of formality.

[4] Unobserved heterogeneity occurs when in addition to the observed variables, other variables are correlated with the observed ones.

[5] Cross sectional data refers to the survey data collected for each subjects (individuals, firms, municipalities) at the same point in time, each subject is observed only once.

[6] Encuesta Nacional de Ingresos y Gastos de los Hogares (Mexican National Survey of Income and Expenditures).

[7] Conteo de Poblacion y Vivienda (Population and Household Census).

[8] Encuesta Nacional de Micronegocios.

[9] Encuesta Nacional del Empleo (National Survey of Employment). The survey is representative at the national and state level, but not municipal level.

[10] Encuesta Nacional de Ocupación y Empleo (National Survey of Occupation and Employment). The survey is representative at the national and state level, but not municipal level.

[11] Th studies of Azuara & Marinescu and Duval & Smith used cross-sectional rather than panel data from ENE/ENOE to avoid the attrition bias.

12 Panel data refers to the survey that includes repeated measurements for a particular subject (individuals, firms, municipalities) for different periods of time, each subject is observed multiple times. Rotating panel refers to the panel datasets that at each wave, part of the individuals are replaced by new ones.

[13] Mexican Family Life Survey.

[14] Encuesta de Evaluación de los Hogares Urbanos (Urban Household Evaluation Survey). The survey is the official instrument of Oportunidades to survey eligible and just above the eligibility cut-off households

[15] Servicio de Administración Tributaria (Tax Administration Service).

Mexico's conditional cash transfer program *Oportunidades* in urban areas (those with more than 15,000 inhabitants); (c) Aguilera assumed that urban households were more likely to choose SPSS over IMSS because of better geographical access to SPSS health care facilities. Duval & Smith limited their analyses to males from 20-60 years of age in urban areas who reported positive earnings from their work, assuming that males participate over longer periods of time in the labor market. Perez-Estrada limited his analysis to male heads of households working in urban areas. Bosch & Cobacho limited their analysis to micro firms registered with IMSS during the observation period to focus on firms at the threshold between formality and informality.

21.   Methodological approaches examined the extent of SPSS growth over various time periods and across households, municipalities and states and its effect, on formal and informal sector participation. The majority of the studies used difference-in-difference approaches[16] (Aguilera; Aterido et al; Azuara & Marinescu; Barros; Bosch & Campos-Vázquez; Bosch & Cobacho; Campos-Vázquez & Knox; Parker & Scott). More recent studies adopted other approaches: Duval & Smith used a mixture model, intending to allow for a more flexible labor market structure including the possibility of rationing formal sector jobs and Perez-Estrada used a random utility binary choice model for panel data[17].

22.   The studies assessed the effect of SPSS growth on participation in the formal and informal sectors applying the legal and productive definitions, although most used the former: Parker & Scott and Bosch & Campos-Vázquez used affiliation with IMSS, Barros and Campos-Vázquez & Knox (A and B) used affiliation with IMSS or ISSSTE, and Duval & Smith used affiliation with IMSS, ISSSTE or employer-based, private health insurance. In contrast, Azuara & Marinescu assessed informal sector participation defined as salaried workers not affiliated with IMSS or ISSSTE, along with the self-employed. Some studies measured participation in the formal or informal sector as a categorical variable (Aterido et al; Azuara & Marinescu; Barros; Campos-Vázquez & Knox (B); Duval & Smith; Parker & Scott; Perez-Estrada) or continuous variable. Studies measuring participation in the formal sector as continuous variable adopted different approaches: Duval & Smith and Campos-Vázquez and Knox (A) used the share of formal sector in total employment, while Bosch & Campos-Vázquez used the quarterly log of the number of workers enrolled and firms registered with IMSS.

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[16] The difference-in-difference method aims to examine the effect of a treatment by comparing the treatment group after the intervention to both the treatment group before intervention and to a control (the control group allows to identify would have happened in the absence of the treatment).

[17] In a discrete choice model, decisión makers choose among a set of alternatives and the model assigns a probability for each alternative to be chosen.

23.   Most of the studies assessed the effect of the SPSS for individuals (Aguilera, Aterido et al, Azuara & Marinescu, Barros, Bosch & Cobacho, Campos-Vázquez & Knox, Duval & Smith, Parker & Scott (B), and Perez-Estrada) (table 1). Aterido et al also assesses the effect at the household level; Bosch & Campos-Vázquez, Duval & Smith, Campos-Vázquez & Knox and Parker & Scott (A) assess it at the municipal level.

24.   Studies defined SPSS enrollment at the level of households, municipalities, health clusters[18] and states (table 1). Parker & Scott (B) tested it for the household level and Campos-Vázquez & Knox (A and B), Parker & Scott, Aterido et al, Bosch & Campos-Vázquez, and Azuara & Marinescu for the municipal level. Aguilera drew upon a study where enrollment was promoted in a group of 74 randomly assigned health clusters (King, 2009). Barros, Duval & Smith and Perez-Estrada tested it at the state level.

25.   The studies defined SPSS enrollment as both discrete (e.g. presence or absence of SPSS) and continuous measures (e.g. level of SPSS enrollment). Parker & Scott (B) distinguished between households with and without SPSS, defining coverage as households with at least one member enrolled into the scheme. Campos-Vázquez & Knox (A and B), Parker & Scott (A), Aterido et al, Azuara & Marinescu and Bosch & Campos-Vázquez distinguished between municipalities with and without SPSS. They defined the presence of SPSS as low levels of enrollment: one individual, more than 10 individuals, more than 5 households, more than 10 households, more than 2% of households or more than 5% of households. Parker & Scott (A) also tested for higher levels of enrollment (25%). Aguilera differentiated between health clusters participating and not participating in a program to promote enrollment. Perez-Estrada distinguished between states participating and not participating in the SPSS. Likewise, in their analysis of the early years of implementation, Smith & Duval distinguished between states participating and not participating in the SPSS. Aterido et al tested also for the percentage of households enrolled into the SPSS Popular in a municipality and Smith & Duval in their analysis of later years of implementation for the percentage of households enrolled in states and the FD. Bosch & Cobacho used the logarithm of the number of quarters a municipality had been participating in the SPSS and Barros used targets to enroll households as a percentage of households without social security in a state or the FD.

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[18] A health cluster was defined as adjoining geographical regions, each with an actual or planned health center and its population.

Table 1. Units of Analysis, Sources of Variance and Intervention Variables

Study	Unit of Analysis	Source of Variance	Intervention Variable
Aguilera	Individual	Health cluster	Participation in promotion program
Aterido et al	Household and individual	Municipality	At least one household is enrolled
Azuara & Marinescu	Individual	Municipality	At least one individual enrolled
Barros	Individual	State	Number of total households agreed to enroll in SPSS in a state and quarter (in a given state)/number of total households not covered by social security in a state (as of 2007)
Bosch & Cobacho	Individual	Municipality	Logarithm of the number of quarters a municipality has been exposed to the SPSS
Bosch & Campos-Vázquez	Municipal	Municipality	More than 10 individuals enrolled
Campos-Vázquez & Knox (A and B)	Municipality and individual	Municipality	More than 10 households enrolled
Duval & Smith	Individual	State	- Participation in program (2000-2004) - Percentage of population enrolled (2005-2009)
Parker & Scott (A)	Municipality	Municipality	At least one individual enrolled At least 25% of population enrolled
Parker & Scott (B)	Individual	Household	At least one individual enrolled
Perez-Estrada	Individual	State	Participation in the SPSS

26.   Study designs varied significantly in the time period covered. Some looked at over relatively short periods and when enrollment was low: Campos-Vázquez & Knox (A and B) and Parker & Scott (B) used data from 2001/2002 to 2004. Barros used data from 2002-2006, checking quarterly reports, while Parker & Scott used data from 2000-2005 for both low participation (where at least one household was enrolled) and higher levels (where 25% of households participated). Aguilera reviewed data from 2005 and 2006, studying a 10-month initiative to promote participation. Others studied longer time periods: Bosch & Cobacho and Perez-Estrada used data up to 2008, and Aterido et al., Azuara & Marinescu, Bosch & Campos-Vázquez and Duval & Smith data up to 2009.

27.   Three research teams tested for endogeneity and three studies adopted designs to avoid endogeneity problems. Azuara & Marinescu studied whether trends in the size of a municipality's or states' informal sector were correlated with the arrival of SPSS. Azuara & Marinescu and Bosch & Campos-Vázquez tested more broadly if independent municipal and state level variables, such as unemployment rates, yearly growth of electricity consumption, determined which year SPSS coverage began. Parker & Scott (B), Duval & Smith, and Campos-Vázquez & Knox assessed the

extent of household level participation in the formal sector as dependent variable, but instead of using individual data on enrollment in SPSS (which would have resulted in endogeneity) used aggregated data at municipal and/or state level as an independent variable.

28.   Several studies used fixed-effects[19] to control for unobserved heterogeneity. Barros, Campos-Vázquez & Knox (A and B), Azuara & Marinescu, Bosch & Campos-Vázquez and Perez-Estrada included both municipal or state level fixed-effects, and time fixed-effects. Aterido et al included municipality fixed-effects for the main analysis (effect of the rollout of the SPSS in a given municipality on the probability that a household in that municipality is covered by social security) and used household-level fixed-effects for the robustness test.

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[19] When characteristic of an entity (household, municipality, state, etc.) may impact or bias the independent or dependent variables, fixed effects remove this effect, thus, allow predicting the net effect.

Table 2. Data and Methods

Study	Source of data	Type of data	Data restrictions	Exposure	Method of analysis	Fixed effects	Tests and controls (yes/no) for endogeneity	Dependent variable	Intervention variable *	Time effects
Aguilera	SAT administrative data	Panel data	Only urban individuals	Up to 2006	Difference-in difference	No	No	Social security affiliation	Categorical	No
Aterido et al	ENE/ENOE	Panel data	Municipalities with a minimum of observations excluded	Up to 2009	Difference-in difference	Municipality and time	Yes	Social security affiliation through job	Categorical and continuous	Yes
Azuara & Marinescu	ENE/ENOE	Repeated cross-sections	Urban (villages with more than 15,000 inhabitants)***	Up to 2009	Difference-in difference	Municipality and time	Regression analysis	Workers not covered by IMSS, ISSSTE and the self-employed	Categorical	No
Barros	ENIGH	Repeated cross-sections	Only workers with a job and positive wage	Up to 2006	Difference-in difference	State and time	Graphical analysis	Social security affiliation	Continuous	No
Bosch & Campos-Vázquez	IMSS administrative data	Municipal panel data	Municipalities without complete IMSS records and temporary workers excluded	Up to 2009	Difference-in-difference	Municipality and time	Yes	Log of number of firms registered with IMSS / number of workers registered with IMSS aggregated at municipality level	Categorical	Yes
Bosch & Cobacho	ENAMIN	Panel data	Firms or individuals without IMSS	Up to 2008	Difference-in-difference	Municipality and time	Regression analysis	IMSS registration	Continuous	Yes

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Study	Source of data	Type of data	Data restrictions	Exposure	Method of analysis	Fixed effects	Tests and controls (yes/no) for endogeneity	Dependent variable	Intervention variable *	Time effects
			registration during observation period excluded							
Campos-Vázquez & Knox (A)	ENE	Panel data	Only urban workers aged 15 – 65 years	Up to 2004	Difference-in difference	Municipality and time	Graphical analysis	Rate of formal workers among all workers	Categorical	Yes
Campos-Vázquez & Knox (B)	ENCELURB	Panel data	Individuals aged 15 – 65 years, FD excluded	Up to 2004	Difference-in difference	Municipality and time	See above	Informal employment in 2004 compared to labor status in 2002	Categorical	Yes
Duval & Smith	ENE/ENOE	Repeated cross-sections	Only males permanently attached to the labor market	Up to 2009	Propensity score model	No	Yes **	Workers registered with social security	Categorical and continuous	No
Parker & Scott (2008A)	CONTEO	Repeated cross-sections	No	Up to 2005	Difference-in difference	No	Yes **	IMSS affiliation at municipal level	Categorical	No
Parker & Scott (2008B)	MxFLS	Panel data	No	Up to 2004	Propensity scores difference-in-difference	No	Yes **	IMSS affiliation	Categorical	No
Perez-Estrada	ENE/ENOE	Panel data	Included only Male households working in urban Mexico	Up to 2008	Random utility choice model	Municipality and time	No	Employment in the formal sector	Categorical	Yes

* Variable defined in table, column 3 (intervention variable); ** Study uses aggregated data at municipal and/or state level to measure SPSS enrollment to avoid endogeneity; *** Study further restricts sample to those with less than 9 years of schooling.

D. Key Findings

29.   Among the four studies that assessed the possible effects of the SPSS for the labor force as a whole, two of them demonstrated statistically significant reductions in the affiliation of households and firms with the formal social security system. Aterido et al showed that the probability of a household being enrolled in social security decreased by 0.4 percentage points in municipalities where at least one household was enrolled in the SPSS. The authors found a slightly larger reduction when assessing the effect at the level of individual workers (0.6 percentage points). The effect peaked at 4 to 6 quarter after the introduction of the SPSS. Bosch & Campos-Vázquez showed that the number of employers enrolled with IMSS decreased by 0.8% in municipalities where 10 or more individuals were enrolled in SPSS. The effect grew over time and three years after the SPSS was introduced, the number of employers registered with IMSS had decreased in these municipalities by 3.8%. In contrast to Aterido et al, Bosch & Campos-Vázquez, Barros and Parker & Scott in two separate studies did not find any statistically significant effects for the total population of workers.

30.   Half of the studies showed that the SPSS affected the social security coverage of sub-groups of workers, households and firms. In some instances, these effects were comparable and larger than those observed in the general population. Characteristics of these sub-groups included worker age, gender, levels of education, geographical location of households and the size of firms.

31.   For employees registered with IMSS, Bosch & Campos-Vázquez demonstrated statistically significant effects related to the size of the company: In municipalities with more than 10 households enrolled in the SPSS, the number of employees registered with IMSS in firms with 1, 2 to 5, or 6 to 50 employees was 1.13% ($p<0.01$), 0.65% ($p<0.1$) and 0.62% (not significant) lower. The effect grew over time and three years later, the number of employees registered with IMSS in these municipalities had decreased by 3.8% in firms with 1 employee ($p<0.05$), 4.3% in firms with 2 to 5 employees ($p<0.01$), and 3.3% in firms with 6 to 50 employees ($p<0.05$).

32.   While most studies limiting their data to urban areas showed no statistically significant reductions in formal-sector affiliation, Perez-Estrada demonstrated that the average effect of introducing SPSS was a decrease in the enrollment of male workers by 1.05 percentage points in urban areas ($p<0.05$). Also, Bosch & Campos-Vázquez demonstrated a significant effect for both urban and rural areas: They found that the number of employers registered with IMSS in municipalities that introduced SPSS more than three years earlier was 0.3% lower in urban areas ($p<0.05$) and 0.6% in rural areas ($p<0.01$).

33.   Three studies demonstrated different effects for different age groups. When further stratifying among employees of firms with two to five workers by age and gender, Bosch & Campos-Vázquez Vazquez showed that the number of workers enrolled in IMSS under the age of 30 was 4.9% lower in municipalities with SPSS three years after its introduction and for females, 6.4% lower. For employees of firms with fewer than five workers, Bosch & Cobacho demonstrated that when compared with workers who are 16 to 24 years old, a 10% raise in the exposure to the SPSS increased the number of workers enrolled with IMSS that are 25-35 years old by 1.1% ($p<0.05$) and the number of workers enrolled with IMSS that are 35 years and older by 2.2% ($p<0.01$). Perez-Estrada showed that the average effect of introducing SPSS on the enrollment of male heads of households in urban areas was higher for younger workers: For example, it was 1.41 percentage points for 25 year-old workers compared to 1.05 percentage points for household heads aged 25 to 60.

34.   For urban areas, Azuara & Marinescu and Perez-Estrada demonstrated effects for workers with lower levels of education. Azuara & Marinescu showed that in municipalities with at least one individual enrolled in the SPSS, the probability of receiving no health benefits through the employer or being self-employed was 0.8 percentage points higher among workers with under nine years of schooling ($p<0.1$). The effect was even more pronounced when the studies further stratified by age and marital status: The probability of receiving no health benefits through the employer was 1.2 percentage points higher for workers that were married with children ($p<0.1$) and 1.4 percentage points for households with heads older than 34 ($p<0.01$). Perez-Estrada showed that the average effect of introducing SPSS on the enrollment of male heads of households with IMSS in urban areas was more pronounced among those with secondary or lower levels of schooling: For example, it was 3.63 percentage points for households heads with primary education ($p<0.05$), compared to 1.05 percentage points for all households heads.

35.   Three studies demonstrated effects for different members and compositions of households. Aterido et al showed that the introduction of the SPSS decreased the probability of households' heads being covered by social security by 0.3 percentage points, of spouses of households' heads with social security by 0.7 percentage points, and of household members other than heads, spouses and dependents by 1.5 percentage points. For household heads in urban areas, Perez-Estrada showed that the introduction of the SPSS decreased the average probability of married males' being affiliated with social security by 1.0 percentage points compared to 1.7 percentage points for single males. For rural households, Parker & Scott (B) showed that the enrollment of one member with SPSS reduced the likelihood of other members' affiliation with IMSS by 15-17 percentage points.

36.   Duval & Smith assessed the probability of male workers to apply for a formal job. They showed that from 2002-2004, in all states plus the FD introducing the

SPSS, the probability of male workers applying for a formal sector job was 0.28% lower ($p<0.1$). Moreover, from 2005-2009, depending on SPSS coverage in the states and the FD, the probability of male workers applying for a formal sector job was 5.7% lower ($p<0.01$). For rural areas, they found that in states with SPSS, the probability of male workers applying for a formal job was 0.57% lower (2002-2004; $p<0.1$) and, depending on SPSS coverage in the states and FD, in rural areas, the probability was 11.6% less (2005-2009; $p<0.01$).

37.   Four studies analyzed the movement of workers from the formal to the informal sector as well as from the informal sector and unemployed into the formal sector following the introduction or promotion of SPSS, and described mostly expected trends (that SPSS will take enrollment away from the social security). Aterido et al showed an increase in the flows from formal salaried to informal salaried employment by 0.5 percentage points and to self-employment by 0.5 percentage points. For urban areas, Aguilera showed a reduction of 0.7% ($p<0.1$) and Campos-Vázquez & Knox one of 0.1 percentage points (not statistically significant) in the probability of workers continuing in a formal job, or, in other words an increased probability of moving from formal to informal, or to being unemployed. For urban workers with less than nine years of schooling, Azuara & Marinescu showed an increase in the probability of switching from formal to informal employment by 0.2 percentage points (not statistically significant). In turn, Aterido et al demonstrated a decline in the flows from informal-salaried to formal-salaried employment by 3.1 percentage points and from self-employment to formal-salaried employment by 1.3 percentage points. For urban workers, Aguilera showed a striking 0.8% increase in the probability of obtaining formal employment ($p<0.05$). For urban workers with less than nine years of schooling, Azuara & Marinescu found a 0.3 percentage point decrease in the probability of switching from informal to formal employment (not statistically significant).

38.   Four papers assessed the effect of the SPSS on wages, wage changes from movements in the labor market and wage differentials across sub-groups. Aterido et al analyzed wage gains and losses from transitions or holding on to an informal sector job compared to remaining in the formal sector. In municipalities without SPSS, they found that a transition from a formal to an informal job resulted in a 1.4 percentage point decrease (not significant), moving from an informal to a formal job in a 1.5 percentage point increase ($p<0.1$) and holding on to an informal job a 0.2 percentage point decrease (not significant). In municipalities with SPSS, a transition from a formal to an informal job resulted in a 0.3 percentage point decrease (not significant), moving from an informal to a formal job in a 0.3 percentage point increase (not significant) and holding on to an informal job in a 0.3 percentage point decrease ($p<0.05$). For male heads of households in urban areas, Pérez-Estrada demonstrated that the introduction of SPSS decreased on average the informal sector wages by 9% ($p<0.01$) and increased the formal sector wages by 5% ($p<0.01$). For urban areas, Azuara & Marinescu did not find any significant effect of the introduction of the

SPSS on wage changes among moving from formal to informal and informal to formal jobs. For micro firms, Bosch & Cobacho did not find any significant effect of the exposure to the SPSS on wage differentials between age groups.

E. Discussion

39.   The SPSS adopted a series of features that allowed rapidly achieving universal health insurance coverage but also made an effect on formal sector employment more likely. The SPSS improves the access of its members to quality services and makes them free at the time of use; it is not targeted to the neediest or enforces contributions from members, and has been rapidly scaled-up to cover within less than a decade more than 90% of all Mexicans without social security. This effort required an investment above and beyond historical levels of spending on the health of Mexicans without social security that is large compared to the costs of other social programs. In 2009, prior to reaching full scale, this amounted to 0.5% of GDP. At the same time, some of its features make it suitable to identify a potential effect on formal sector employment, most importantly, its swift but gradual roll out.

40.   Research responded quickly to the concerns of policy-makers about this possible, unintended consequence. To our knowledge, the 12 studies carried out to-date and presented in 10 papers constitute the most comprehensive set of analyses of the impact of health financing arrangements on labor market outcomes in the world. The studies are in general of high quality with the only two caveats that earlier studies had to rely on data sets with relatively short periods of exposure to the reform and some studies used cross-sectional instead of panel data methods, thus, less effectively controlling for unobservable effects. All of the studies used robust research designs, with some of them testing, others controlling for endogeneity and the majority controlling for unobserved heterogeneity. The studies focused on effects on formal or informal employment. Transitions and wage effects have not been analyzed extensively with few estimates available to date.

41.   The majority of studies adopted a similar research approach (seven). They assessed the effect of the presence or coverage of the SPSS at the municipal or state level on employee or employer registration with social security among large population groups drawing on information from national surveys or administrative sources using cross-sectional and panel data methods and models that assume a competitive labor market. The studies of Aguilera and Parker & Scott (B) followed in general this approach, but adopted different definitions of SPSS presence and enrollment. Aguilera tested the effect of promoting enrolment and Parker & Scott (B) the effect of enrollment of a household member. Campos-Vazquez & Knox and Bosch & Cobacho employed data sets that are restricted to population groups that make the studies likely to under or overestimate an SPSS effect. Campos-Vazquez & Knox drew on the ENCELURB, the instrument of *Oportunidades* - Mexico's

conditional cash transfer program - to survey eligible and just-above the eligibility cut-off households. As such, the data sample was strongly biased towards poor and informal workers and the study likely to underestimate any effect. Bosch & Cobacho used the ENSAMIN, building on earlier research that demonstrated larger effects among employees of micro firms to search for different responses of employee groups. Their estimates were likely to overestimate the overall effect. Duval & Smith searched for an effect of the SPSS on the likelihood of workers to apply for a formal job and adopted a mixed model to allow for the possibility of a segmented market structure with rationing of formal jobs.

42.   Among the eight studies that assessed the effect of SPSS presence or enrollment on formal or informal sector employment in the general or urban population, a pattern seems to emerge that supports the view that the SPSS did have an effect on formal employment; however, as we discuss later, the effect was much smaller than often argued in the public debate. Among the four studies that searched for an effect among the entire population, two demonstrated positive findings. Aterido et al showed a statistically significant reduction in the probability of workers to enroll with social security and Bosch & Campos a statistically significant reduction in the enrollment of employers with IMSS. Bosch & Campos also showed reductions in the enrollment of workers with IMSS, however, these reductions lacked statistical significance. In contrast, the studies of Barros and Parker & Scott did not find consistent patterns of change or changes that were statistically significant. However, compared to the research designs of Aterido et al and Bosch & Campos, the designs of Barros and Parker & Scott used data from the early stages of SPSS implementation, where an effect was likely to be smaller and thus more difficult to detect (see below).

43.   Four studies searched for a possible effect of the SPSS on workers in urban areas. Perez-Estrada showed a significant effect of the SPSS presence for male heads of households on enrollment with social security. Azuara & Marinescu showed similar trends, however, with statistical significance only when restricting the sample to workers with less than nine years of schooling. Aguilera and Campos-Vazquez & Knox did not find any systemic pattern. However, Azuara & Marinescu and Campos-Vazquez & Knox used cross-sections rather than panel data. Campos-Vazquez & Knox also drew on data from the early stages of implementation. While Aguilera used panel data, in the study's experimental design, the exposure to the intervention was limited to a short period of time. The findings of Perez-Estrada are also supported by the findings of Duval & Smith, who demonstrated that the probability of male workers to apply for a formal job was lower dependent on SPSS coverage. Some of these studies restricted data to urban areas under the assumption that effects were more likely due to greater access to health services. As we discuss below, however, there is evidence that the effect may be larger in rural areas. If so, this may explain why the four studies were less likely to find an effect in the first place.

44.   Eight studies looked at groups of workers that are more likely to be informal and found more frequently significant and at times stronger effects. Bosch & Campos demonstrated statistically significant effects on the enrollment of employees with IMSS among small firms but not large firms; furthermore, these effects were larger in firms with fewer workers. Bosch & Campos showed also larger effects on enrollment with IMSS in rural compared to urban areas. Likewise, Duval & Smith demonstrated larger effects on the probability of male workers to apply for a formal job in rural than in urban areas. While Azuara & Marinescu did not find a general effect in urban areas, they showed a reduction in the enrollment with social security when they stratified for workers with less than nine years of schooling. Likewise, Perez-Estrada showed that the average effect of introducing SPSS on the enrollment of male heads of households with IMSS in urban areas was stronger among workers with secondary or lower levels of schooling. While the literature suggests that younger workers are more likely to be informal, some authors assumed a larger effect among older workers as tend to value health benefits more. The empirical findings were also not fully conclusive. Bosch & Campos and Bosch & Cobacho showed larger effects of the SPSS on enrolment with IMSS among younger workers in small firms. Similarly, Perez-Estrada showed that the average effect of introducing SPSS on the enrollment of male heads of households was higher for younger workers. However, when Azuara & Marinescu stratified for age among workers with less than 9 years of schooling, they showed a larger effect for workers older than 34 years. While the literature suggests that women are more likely to be employed in the informal sector, the studies did not produce much evidence to support this assumption. Only when Bosch & Campos-Vázquez stratified among workers in small firms for age and gender, they demonstrated a larger effect on females for the age group of 15 to 24 years.

45.   Studies searched for effects among different members and sizes and compositions of households. Perez-Estrada showed that the effect of the SPSS was larger among singles than married male heads of household and Azuara & Marinescu showed that among households where heads have less than nine years schooling, the effect of the SPSS was larger among those married with children. Thus, household size and the role and status of members seems to matter. Moreover, Aterido et al demonstrated an effect that was - compared to heads of households – larger among spouses and dependents and even more pronounced when the head of the household was enrolled in social security. Yet, Aterido et al found the highest drop in the probability of enrolling in social security among household members other than spouses and immediate dependents. The household members are not covered through the social security membership of the head of household or her spouse, as coverage of dependents is limited to immediate dependents. However, by dropping out of social security and enrolling into the SPSS, these individuals provide the entire household with SPSS coverage, as it extends also to parents of the head of household and spouse as well as economically dependents living in the home. These findings suggest that the SPSS enrollment criteria of lack of social security coverage may not be strictly

enforced. Moreover, they support the view that larger households may see the SPSS as a complement rather than a substitute of social security coverage. This, however, may not hold true in rural areas. Parker & Scott showed that the enrollment of one member with SPSS reduced the likelihood of other members' affiliation with IMSS by 15 to 17 percentage points, or of more than 80% given a baseline of 18%.

46.   Aterido et al and Aguilera demonstrated significant changes of labor market flows, mostly in line with the effects seen on formal and informal employment. Aterido et al demonstrated increased flows of workers from formal jobs to both informal salaried jobs and to self-employment in the presence of SPSS. Aterido demonstrated also a decline in the flows from informal salaried to formal salaried workers and from self-employment to formal salaried work. Aguilera showed a significant reduction in the probability of workers continuing in a formal job under efforts to promote affiliation in urban areas, however, a striking increase in the probability of obtaining a formal job. The findings of Aterido et al suggest that the decrease in the flow from informal to formal work may exceed the increase in the flow from formal to informal employment and thus drive the reductions in formal and increases in informal employment. This interpretation is consistent with the practice of social security to offer a bundle of benefits, with some of them, like old-age pension, only available after longer periods of contribution.

47.   In the two studies that demonstrated an effect on the broader worker population, the estimates of the magnitude of the effect were rather similar and relatively small. Aterido et al showed a 0.4 percentage point decrease in the affiliation with social security for households and a 0.6 percentage point decrease for individuals. With a level of formality of approximately 50% (according to administrative data and the productive definition), these estimates translate into absolute reductions of 0.8% and 1.2%. Bosch & Campos-Vázquez showed a 0.8% reduction for employers with the introduction of the SPSS. Given the concentration of the effect in smaller firms, the effect on employees is likely to be lower.

48.   As much as they are comparable, statistically significant effects in sub-populations tended to be higher and in some instances significantly exceeded estimates for the overall population. Aterido et al demonstrated larger effects for household members other than heads, among them, the largest reduction in the probability of social security affiliation of 1.5 percentage points for members that are not spouses or immediate dependents. For urban areas, Perez-Estrada demonstrated an average effect of 1.1 percentage points for male heads of households that increased to 3.6 percentage points for household heads with primary education only. Bosch & Cobacho demonstrated a stronger effect for young workers in small firms. Perez-Estrada demonstrated an average effect on 25 years male heads of households of 1.4 percentage points, and Bosch & Campos-Vázquez showed an effect of 4.9% for workers below 30 years and among them, for females of 6.4%.

49.   Much of the variation in the estimates may be the result of different research approaches. As discussed before, the exposure, restrictions and the use of data sets, and the selection of outcome measures seem to matter. Reasons that may explain the smaller than in the literature anticipated effect may include the small size of the benefits of the SPSS compared to the significantly larger bundle of social security benefits, moreover, that contributions to pensions in the social security schemes will be lost if members do not contribute for 25 years. In addition, the benefits of SPSS membership may become diluted as SPSS services are primarily delivered through input-based financed public health facilities that offer services to individuals without SPSS membership.

50.   Several findings suggest that the effect increases over time though. Bosch & Campos demonstrated that the effect on employers increased from 0.8% in the year of the SPSS introduction to 3.8% three years later. Similarly, Aterido et al showed that the effect peaked between three and eight quarters after the introduction of the SPSS. Bosch & Cobacho also demonstrated that the effect in small firms increases with the exposure to SPSS. These findings are consistent with the general observation that only later studies demonstrated an effect. They could be the result of a targeting of the SPSS to poor households in the early years of implementation. Moreover, while financial benefits of the SPSS are immediate, improvements in the access to quality care accrue over time (Bosch & Campos). In addition, it could take people time to learn about the kinds of tangible benefits of the SPSS, assess the plan that best suits them and act on it.

51.   Aterido et al demonstrated that the effect of the SPSS increases up to 8 to 12 quarters to decline thereafter. Diminishing increases could reflect a saturation effect and the later decline as the result of a secondary increase in the wage gap between formal and informal employment.   While Perez-Estrada demonstrated such an adjustment, Aterido et al, Bosch & Cobacho, and Azuara & Marinescu did not observe a decrease or increase in formal and informal sector wages.

52.   The interpretation of the demonstrated effects as a consequence of the SPSS hinges on the proof that its roll out was unrelated to trends in formality and its determinants.   Five studies tested for such relationships and did not find any correlation. Campos & Knox depicted trends in formal employment for cities with or without SPSS before and after its introduction and showed no differences in trends between the groups of cities over the entire period. Barros plotted quarterly affiliation targets against increases in the wage gap between formal and informal employment (relative to 2000) and did not identify any systematic patterns. Azuara & Marinescu regressed the year of SPSS introduction in municipalities against the share of informal workers and other labor market outcomes in 2000 and did not find any correlation. They also compared cities that adopted the SPSS before and after 2004 without showing any link to formality. Similarly, Bosch & Cobacho regressed the number of

quarters since the introduction of the SPSS in municipalities against the share of informal workers in 2000 and did not find any relationship.

53.   A causal relationship seems even more likely as the introduction of the SPSS was not accompanied by any other major policy change that may have affected the balance between formal and informal employment. Since the introduction of the SPSS, Mexico has not seen any increase in income taxes or social security contributions, nor did the social security benefits see any significant changes. The expansion into urban areas of *Oportunidades* - Mexico's conditional cash transfer program - fell into the same period; yet, the program is well targeted to the poor and research did not show any significant effects on formality. Also the introduction of a non-contributory pension scheme in the FD fell into the expansion period of the SPSS period, but several of the studies showed that eliminating data from the FD had no impact on the results.

54.   As a whole, the exemplary research carried to date leaves little room for any doubts that the introduction of the SPSS had an effect on the size of the formal sector. However, the size of the observed effect is much smaller than it has often been argued in the public debate. Moreover, it seems small compared to the improvements in health insurance coverage and the associated improvements in access to quality care and financial protection for more than half of Mexico's population. Yet, assessing the value of the SPSS as the balance between its impact of the formal sector and on health and financial protection seems a misleading view and approach. The SPSS has been proven a powerful instrument to guarantee a constitutional right for more than half of all Mexicans. The more appropriate policy question is therefore how to design a health financing system for all Mexican's that minimizes distortions of the labor market or any other negative externalities.

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