

Wage-shifting effects of severance payments savings accounts in Colombia

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Abstract

In 1990, Colombia replaced its traditional system of severance payments with a new system of severance payments savings accounts (SPSAs). Although severance payments are often justified on the grounds that they provide insurance against earnings loss, they also increase costs for employers and distort employment decisions. The extent of these distortions depends largely on how much of the costs of severance pay can be shifted from employers to workers. One reason why the effects of severance pay may not be completely shifted is that workers may fear the firm will “take the money and run” by declaring bankruptcy. A system of SPSAs eliminates this moral hazard problem, so it should facilitate the shifting of severance payments’ costs to workers in the form of lower wages. Empirical results using the Colombian National Household Surveys (NHS) indicate that the introduction of SPSAs lowered wages by between 60% and 80% of total severance payment contributions. These results are consistent with increased shifting after SPSAs were introduced.

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1. Introduction

In Latin America, much as in Europe, high severance payments and other dismissal costs are often blamed for labor market rigidity and high unemployment rates. On the worker side, severance payments, like unemployment insurance, probably increase reservation wages and reduce exit rates from unemployment (see, e.g., Ehrenberg and Oaxaca, 1976). On the firm side, government-mandated severance paid at the time of separation distorts incentives to hire and fire (see, e.g., Bentolila and Bertola, 1990; Hopenhayn and Rogerson, 1993), at least when such schemes cannot be undone by private transfers from workers to firms in the form of lower wages.¹ One reason why these transfers may not be fully offset is because of imperfections in capital markets that prevent complete consumption smoothing and limit the amount that workers are willing to pay upfront. Another reason is that workers may not be willing to make upfront payments because they may fear that the firm will “take the money and run” by declaring bankruptcy.

In 1990, Colombia introduced a labor market reform that transformed the traditional severance payments system in the formal sector, which required employers to pay severance at the time of separation. In particular, the reform introduced a new system of fully funded Severance Payments Savings Accounts (SPSAs) for formal workers hired after 1990. The SPSAs required employers to deposit a percentage of wages into guaranteed individual accounts available to workers in the event of job separation.

This paper asks whether the introduction of SPSAs reduced distortions in the labor market. The idea is that changing from a traditional system of severance payments to a system of SPSAs should reduce firm default and facilitate shifting of severance payments' costs to workers in the form of lower wages. Thus, SPSAs should reduce employment distortions in the labor market by neutralizing government-mandated severance with private transfers.

The empirical analysis looks at wages of formal and informal workers (i.e., workers covered and not covered by severance payments) who were hired before and after 1990 (i.e., workers only eligible for SPSAs and workers eligible for traditional severance payments). Using data from the National Household Surveys (NHS) for 1988–1996, I find that the wages of workers covered by severance payments and eligible for SPSAs decreased by between 60% and 80% of employers' SPSA contributions after 1990. These results suggest additional shifting after the introduction of SPSAs compared to the situation with traditional severance payments.

The rest of the paper proceeds as follows. Section 2 describes the introduction of SPSAs in Colombia. Section 3 presents empirical evidence on the effects of SPSAs on wages. Section 4 concludes.

2. Severance payments savings accounts in Colombia

Prior to the 1990 labor market reform, the system of severance payments in Colombia resembled the traditional system in many countries, requiring employers to pay severance at the time of separation.

¹ Lazear (1990) was the first to propose that any government-mandated severance payment could be undone by a ‘voluntary’ transfer from workers to firms. Lazear (1990) also explains why government-mandated severance payments may be hard to undo in practice.

Before the reform, employers were required to provide severance pay equal to 1 month per year worked, based on the salary at the time of separation (specifically 8.3% of the salary). The exceptions were self-employed, family workers, and workers in firms with less than five employees, and domestic workers, who were entitled to only half of 8.3%.² Moreover, the legislation allowed covered workers to borrow from their severance pay for investments in housing and education, by deducting the amount from the payment at the time of separation.³ Prior to the reform, the loans were credited in nominal terms and not appropriately adjusted for inflation. In a country like Colombia with high rates of inflation, this accounted for a substantial extra cost.⁴

Lazear (1990) shows that severance payments of this sort should not generate any distortions if they can be offset by private transfers from workers to firms in the form of lower wages. In practice, however, imperfections in capital markets that prevent complete consumption smoothing may limit the amount that workers would be willing to pay upfront. Second, government-mandated severance pay will not be completely offset if minimum or bargained wages limit the ability of workers to accept low enough wages. Finally, full shifting is prevented if workers fear the firm will “take the money and run” by declaring bankruptcy.

All of these limitations were likely important in the Colombian context. Evidence for developing countries suggests failures in formal credit and insurance markets.⁵ In addition, recent evidence suggests that minimum wages bind in Colombia (Bell, 1997; Maloney and Nuñez, 2004). Finally, it was well known in Colombia that, under the old regime, firms about to go bankrupt would simply not pay severance or would negotiate a package substantially below what was owed in severance payments (see, e.g., Ocampo, 1987).

The 1990 reform introduced two major changes with respect to severance payments in large part trying to address firm default under the old regime. First, the amount of severance payments was reduced because employers were no longer required to pay 1 month per year worked out of the salary at the time of separation. Instead, they were required to pay 1 month per year worked based on the salary at each point in time. Since salaries increase with tenure, this adjustment reduces severance payments. Moreover, since workers could continue to borrow against their severance payments, the 1990 reform introduced proper adjustments of the loans for inflation.

The most important change introduced by the reform was the introduction of a system of guaranteed SPSAs which replaced the traditional system of severance payments for all new contracts. In particular, the system of SPSAs automatically applied to any new

² In practice, many workers are employed by firms that do not comply with labor legislation and thus are not covered by severance payments. Employment in such informal sector firms accounts for around 50% of total employment in Colombia.

³ The total amount that could be borrowed was limited to the severance payments the worker had earned up until that date.

⁴ According to Ocampo (1987), the fact that prior to the reform, loans were credited in nominal terms implied an additional 35% of total severance payments in the manufacturing sector. That is, according to Ocampo's estimates, the improper crediting of loans raised severance costs by an additional 2.9% of the yearly salary in the manufacturing sector.

⁵ See Morduch (1995), Alderman and Paxson (1994), Deaton and Paxson (1992), Paxson (1992), Rosenzweig and Wolpin (1993), and Townsend (1994, 1995).

contract signed after January 1, 1991. That is, workers hired after this date were only eligible for the system of SPSAs and were ineligible for the traditional system of severance payments that existed before the reform. On the other hand, workers hired before January 1, 1991 were not initially eligible for SPSAs. However, after May of 1991, workers whose contracts were signed before this date were allowed to voluntarily opt into the new system, although few actually did.⁶ The new system required employers to make a monthly payment into an individual savings account for each worker equal to 8.3% of the salary at each point in time. The new system also imposed fines of 12% of the severance payments on employers who failed to make monthly deposits into individual accounts. In addition, the reform established administrative agencies to monitor and invest the money deposited into the individual accounts. The agencies were required to ensure that the accounts earned at least the average return on 3-month treasury bonds, based on an average determined by the Central Bank every quarter. As before, employed workers were allowed to withdraw funds from the individual savings accounts for investments in housing and education. Unemployed workers and retired workers had unrestricted access to all funds in their savings accounts.⁷

The reform established a monthly employer contribution rate of 8.3% as before. However, the fact that uncertainty about the payment of severance disappeared with SPSAs likely helped employers to shift more of this payment to workers in the form of lower wages than under the previous regime. Under the traditional system, firms only pay severance when there is a separation and the firm has not declared bankruptcy; but under the system of SPSAs, the firm pays no matter what. When severance payments are guaranteed, workers should be more willing to accept wage cuts to assume part of the costs of severance payments. The SPSA system essentially replaces employer insurance with more reliable self-insurance against temporary income shocks.

The SPSA system is similar to the Unemployment Insurance Savings Accounts system (UISA) proposed by [Feldstein and Altman \(1998\)](#) and [Hopenhayn and Hatchondo \(2002\)](#).⁸ UISAs require employers to deposit a portion of workers' wages into special accounts to be used in the event of unemployment. Positive balances in the accounts earn the return on risk-free assets; negative balances are charged that same rate or forgiven. Positive balances remaining at the end of the working life are turned into retirement income. The advantage of this system, according to proponents, is that it internalizes the cost of unemployment benefits, thus substantially improving incentives to work, in contrast to the traditional unemployment insurance system. The extent to which UISAs provide employer insurance or self-insurance, depends on how much of the unemployment benefits are paid by workers and how much by employers. Similarly, as the amount of

⁶ According to a study conducted in the early 1990s by an independent think tank in Colombia, only about 1% of all workers hired before the reform opted into the new system ([Lora and Henao, 1995](#)).

⁷ Similar individual accounts for specific benefits such as health and unemployment exist in the United States, Austria, Chile and Brazil, while comprehensive individual welfare accounts exist in Singapore (see, e.g., [Eichner et al., 1996](#); [Holzmann et al., 2003](#)).

⁸ [Folster et al. \(2002\)](#) simulate the effect of introducing similar accounts in Sweden.

severance paid by employers falls, employer insurance is replaced with self-insurance, and the incentives for both firms and workers improve.⁹

3. Empirical evidence on the effect of SPSAs

This section uses data from the Colombian National Household Surveys to evaluate the effects on wages of the switch from the traditional system of severance payments to the system of SPSAs introduced in 1990.

3.1. Data

The analysis uses data from the June Surveys of the National Household Surveys (NHS) for the years 1988, 1992, and 1996. These data are useful because the NHS covers the periods both before and after the reform, allowing me to exploit the temporal variation in the legislation.

In June, the NHS includes questions about employment in the formal sector (i.e., taxable and covered by regulations) and the informal sector (i.e., not taxed and essentially unregulated). Since employers who comply with one part of labor legislation are likely to comply with all elements of labor legislation, the NHS uses information on whether the employer made social security contributions as a proxy for whether an employee is a formal worker. This variable is then used to identify whether workers were covered by severance pay legislation. The June surveys also include information on tenure which can be used to identify who was hired before and after the reform and, thus, to distinguish between workers only eligible for SPSAs and workers eligible for traditional severance payments.

To determine the effect of SPSAs on wages, I use the log of real hourly wages as the dependent variable. This variable is constructed by dividing weekly wages in the main job by the average number of hours worked per week, then deflating to 1998 prices using the consumer price indexes by city. The CPIs come from the National Department of Statistics for June of 1988, 1992, and 1996. The controls used in the hourly wage regressions include dummies for sex and marital status; years of education; potential experience and potential experience squared;¹⁰ tenure and tenure squared; year dummies; a formal or severance pay coverage dummy (constructed as described above); a permanent contract dummy which takes the value of 1 for those with indefinite contracts and the value of 0 for those with fixed-term contracts;¹¹ firm size dummies for firms with 2–5 employees, 5–10 employees, and more than 10 employees; industry dummies defined at the one-digit level

⁹ While employer insurance is better than self-insurance when workers are faced with idiosyncratic shocks—because it allows risk to be pooled across workers who do and do not separate from their jobs—self-insurance is clearly better when the shock occurs at the level of the firm (such as firm bankruptcy). The optimal amount paid by workers depends on the consumption smoothing gains compared to the distortions induced to firm and worker behavior.

¹⁰ This experience variable was constructed in the standard way as age minus years of education minus 6.

¹¹ In Colombia, both workers with indefinite and fixed-term contracts are entitled to severance pay. However, those under fixed-term contracts are more likely to be employed in the informal sector and not to be covered by severance pay.

and city dummies (the data includes information on the seven largest metropolitan areas in Colombia, i.e., Barranquilla, Bucaramanga, Bogotá, Manizales, Medellín, Cali, and Pasto). Table 1 presents summary statistics for formal and informal workers (i.e., workers covered and not covered by labor legislation) in the three survey years. I restrict the analysis to workers between 20 and 59 years of age, who have stronger labor market attachments and are more likely to be covered by severance pay legislation.

3.2. Differences-in-differences-in-differences estimation

To examine the effect of the change from the traditional system to a system of SPSAs on hourly wages, the estimation exploits three dimensions of variation. The first is temporal and comes from comparing the periods before and after the reform (i.e., the pre- and post-1990 periods). The second is cross-sectional and comes from comparing workers covered and not covered by severance pay legislation (i.e., formal and informal sector workers). The third comes from comparing workers only eligible for SPSAs and workers

Table 1
Descriptive statistics, NHS data

Variable	1988		1992		1996	
	Formal (covered)	Informal (uncovered)	Formal (covered)	Informal (uncovered)	Formal (covered)	Informal (uncovered)
Real hourly wage	2570.74 (3651.54)	1699.77 (2837.34)	2560.03 (3254.64)	1659.65 (2619.43)	2940.86 (5927.97)	1834.15 (4486.99)
Expected share of SP cost	6.46	3.05	6.47	3.11	6.15	3.03
Tenure	5.51 (5.92)	4.34 (5.65)	5.24 (5.52)	4.24 (5.49)	5.18 (6.19)	4.47 (6.14)
% Men	68.37	67.66	66.36	66.94	62.77	67.74
% Married	70.26	72.71	74.35	75.29	73.3	76.06
Education	9.06 (4.28)	6.27 (3.75)	9.66 (4.19)	6.74 (3.75)	9.98 (4.11)	7.03 (3.79)
Experience	19.97 (11.58)	23.35 (12.26)	19.47 (10.86)	23.18 (11.82)	19.54 (10.74)	23.18 (11.67)
% Permanent employees	90.94	78.43	89.95	75.94	88.26	74.16
% Mining	1.09	0.3	0.6	0.31	0.57	0.32
% Manufacturing	29.07	18.57	29.34	18.6	25.49	18.48
% Electricity	1.95	0.02	1.8	0.13	1.38	0.15
% Construction	4.57	8.58	3.87	9.51	4.51	10.75
% Commerce	20.15	34.71	20.92	33.74	21.98	31.77
% Transportation	7.72	8.53	6.89	8.91	7.74	10.58
% Finance	9.39	3.37	10.29	3.44	11.14	4.17
% Service	26.06	25.92	26.29	25.36	27.19	23.76
% Firm size 2–5 employees	11.29	61.2	11.39	59.3	14.02	56.46
% Firm size 6–10 employees	9.8	17.23	8.68	15.25	9.29	14.53
% Firm size >10 employees	78.91	21.57	79.93	25.45	76.69	29.01
N	7490	7388	7028	6367	7567	5457

The table reports means and percentages. Standard deviations are in parentheses. Formal workers or workers covered by labor legislation are defined as those whose employer pays social security contributions, while informal workers or workers not covered by labor legislation are those whose employer does not pay social security contributions.

Table 2
Difference-in-difference-in-difference estimate of the effect of severance payments savings accounts on hourly wages

Year/tenure	Short-tenure workers (eligible)	Long-tenure workers (ineligible)
<i>(A) Formal workers (covered)</i>		
After reform	2410.95 (35.19) [10,451]	3631.41 (108.25) [4144]
Before reform	2216.84 (37.51) [5105]	3328.25 (103.73) [2385]
Time difference for given tenure	194.11 (51.43)	303.15 (149.93)
Difference-in-difference		–109.05 (158.5)
<i>(B) Informal workers (uncovered)</i>		
After reform	1688.34 (38.98) [9146]	1917.24 (60.75) [2678]
Before reform	1615.27 (36.7) [5699]	1984.88 (73.85) [1689]
Time difference for given tenure	73.07 (53.54)	–67.64 (95.62)
Difference-in-difference		140.71 (109.59)
Difference-in-difference-in-difference		–249.76 (192.7)

Cells contain mean hourly wages for the group identified. Standard errors are in parenthesis and sample sizes are in brackets. The years after the reform are 1992 and 1996, while the year before the reform is 1988. Short-tenure and long-tenure workers, or workers eligible and ineligible for SPSAs, are defined by whether they have less or more than 6 years of tenure. Formal workers or workers covered by labor legislation are defined as those whose employer pays social security contributions, while informal workers or workers not covered by labor legislation are those whose employer does not pay social security contributions. The difference-in-difference-in-difference estimate is calculated as the difference-in-difference from the upper panel minus that in the lower panel.

eligible for the traditional severance payments system (i.e., short-tenure workers who were hired after 1990 and long-tenure workers who were hired before 1990).¹² The strategy therefore consists of comparing workers before and after by coverage and eligibility status.

Table 2 illustrates triple difference (DDD) estimation of the effect of the switch from the traditional system of severance payments to the system of SPSAs. The top panel compares changes in hourly wages for eligible workers (i.e., short-tenure workers) to changes in

¹² In the rest of the paper, I refer to long-tenure workers who were hired before the reform, for short, as ineligible workers for SPSAs. Note that covered workers observed after the reform but hired before January 1, 1991 were not initially eligible for SPSAs, but were allowed to opt into the SPSAs system after May of 1991. However, as pointed out above, only 1% of these workers were reported to have opted into the new system (Lora and Henao, 1995).

hourly wages for ineligible workers (i.e., long-tenure workers) after the reform. Each cell contains the mean average real hourly wage for each group, along with the standard errors and the number of observations. There was a rise of close to 200 pesos for eligible workers after the reform, but an even bigger rise of close to 300 pesos for ineligible workers after the reform. Thus, there was a relative significant fall of 100 pesos for eligible workers after the reform. This is the differences-in-differences estimate of the impact of the reform. To control for macro shocks facing recently hired workers during this period, I perform the same exercise for the control group of informal workers. For informal workers, I find an increase in wages for short-tenure workers relative to long-tenure workers after the reform. Taking the difference between these two panels suggests a statistically significant fall in wages of 250 pesos after 1990 for formal workers eligible for SPSAs, compared to the change for ineligible workers.

This DDD estimate provides some evidence that the switch to an SPSA system shifted some of the severance cost to workers as lower wages. However, this analysis gives a rough grouping of those hired before and after the reform as those with less and more than 6 years of tenure. While this grouping allows to distinguish between workers hired before and after the reform for individuals observed in 1996, a better approximation for those observed in 1992 would be those with less and more than 2 years of tenure. Moving to a regression framework allows us to distinguish exactly between eligible and ineligible workers, hired before and after 1990, depending on their survey year.¹³ Moreover, a regression framework allows us to control for other changes in observables within the groups.

The following regression provides triple differences estimates of the effects of switching from the traditional severance pay system to the system of SPSAs:¹⁴

$$\begin{aligned} \ln w_{it} = & \alpha_t + \beta'_1 X_{it} + \beta'_2 T_i + \beta_3 \text{COVERED}_i + \beta_{4t} \text{ELIGIBLE}_i \\ & + \beta_{5t} \text{COVERED}_i + \beta_6 \text{ELIGIBLE}_i \times \text{COVERED}_i \\ & + \beta_7 \text{ELIGIBLE}_i \times \text{COVERED}_i \times \text{POST90}_t + \varepsilon_{it}, \end{aligned} \quad (1)$$

where the dependent variable is the log of hourly wages; α_t is a year effect; X_{it} is a vector of covariates; T_i are the tenure variables; COVERED_i is a dummy that takes the value of 1 if one's employer paid social security contributions and 0 otherwise, which proxies for whether the person was covered or not by severance pay legislation either before or after the reform; ELIGIBLE_i is a dummy which takes the value of 1 for workers hired after the reform (i.e., workers with less than 6 years of tenure in 1996, and workers with less than 2 years of tenure in 1992) and 0 otherwise, and which identifies those who are only eligible for SPSAs; and POST90_t is a dummy which takes the value of 1 for survey years 1992 and 1996 and 0 for 1988.

The year effects control for time series changes in wages (e.g., macroeconomic shocks) affecting all workers (α_t); the tenure variables control for time-invariant differences in wages

¹³ Since the surveys are conducted in June, workers in the 1992 survey are identified as eligible if they have tenure of 1.5 years or less. Similarly, workers in the 1996 survey are identified as eligible if they have tenure of 5.5 years or less. In what follows, I refer to these workers as workers with "less than 2 years" and "less than 6 years" of tenure.

¹⁴ This triple differences estimation is similar to the one found in Gruber (1996) to study the impact of mandated maternity benefits on wages.

attributable to the effects of firm-specific human capital and other factors (β_2); and the covered dummy controls for any time-invariant factors affecting formal workers covered by severance pay legislation (β_3). The second-level effects control for time-varying effects of recently hired workers (β_{4t}), time-varying effects of workers covered by severance pay legislation (β_{5t}), and time-invariant differences in wages between recently hired workers in the covered and uncovered sectors (β_6). The third-level interaction (β_7) captures all variation in wages specific to covered workers eligible only for SPSAs (i.e., observed after 1990 and with less than 2 years of tenure in 1992 and less than 6 years of tenure in 1996) relative to covered workers ineligible for SPSAs (i.e., observed before 1990 or observed after 1990 but with more than 2 years of tenure in 1992 and more than 6 years of tenure in 1996) and relative to uncovered workers. The coefficient of the third-level interaction is the equivalent DDD estimate of the effect on wages of switching from the traditional severance payments system to the system of SPSAs in the regression analysis.

A negative coefficient β_7 implies a wage reduction for covered sector workers under the new regime of SPSAs. For example, a coefficient β_7 of -0.083 corresponds to a decline in wages of 8.3%, which is the amount deposited by employers into the individual savings accounts. An insignificant coefficient on the third-level interaction would imply that the guaranteed individual savings accounts did not change the incentives for firms and workers to establish voluntary transfers in the form of lower wages to neutralize government-mandated severance payments.

Table 3 presents the estimates of the level effects and the second- and third-level effects in Eq. (1). Columns (1)–(4) present the estimates of the third-level interaction with the $POST90_t$ dummy, while Columns (5)–(8) present the estimates of the third-level interaction with individual year dummies. When no other controls are included, the estimate suggests a significant reduction in wages of 8% for covered workers eligible for SPSAs. The coefficient, however, falls to 6.9%, but continues to be significant at the 1% level when controlling for other covariates. In addition, controlling for industry and size dummies reduces the significant coefficient to 6.5% and 5.2%, suggesting a shift of severance costs of between 78% and 62% of the contribution made by employers into the savings accounts over any shifting already taking place before the introduction of SPSAs.¹⁵

Columns (5)–(8) in Table 3 show similar, although somewhat less precise, results when instead of grouping the post-reform period, the effects are evaluated for each post-reform year. The coefficients of the third-level interaction for 1996 are always bigger than those for 1992. This is consistent with increasing confidence by workers in the new system in terms of eliminating firm default. The coefficients controlling for covariates suggest effects between 7.8% and 7.4% for 1996 and effects between 6.4% and 4% for 1992.¹⁶

¹⁵ The p -value when industry dummies are included is 0.007, while the p -value when both industry and size dummies are included is 0.032.

¹⁶ The p -values for the third-level interaction with 1996 are between 0.05 and 0.07, while the p -values for the third-level interaction with 1992 are 0.02 and 0.04 without size dummies but 0.15 when the size dummies are included.

Table 3

Nonparametric estimates of the effect of severance payments savings accounts on hourly wages

Level effects and second and third-level interaction effects	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1992	-0.032 (0.0209)	-0.796 (0.0187)	-0.791 (0.0186)	-0.074 (0.0185)	-0.0291 (0.0215)	-0.0784 (0.0193)	-0.0769 (0.0193)	-0.0711 (0.0192)
1996	0.0194 (0.0289)	-0.061 (0.0256)	-0.0621 (0.0254)	-0.0502 (0.0254)	0.0088 (0.034)	-0.0683 (0.0306)	-0.0698 (0.0304)	-0.0606 (0.0303)
Covered	0.4897 (0.0218)	0.1975 (0.018)	0.1881 (0.0182)	0.1171 (0.0198)	0.4869 (0.0222)	0.1964 (0.0183)	0.1861 (0.0184)	0.1144 (0.02)
Tenure	0.0189 (0.0019)	0.0105 (0.0016)	0.0109 (0.0016)	0.0125 (0.0015)	0.0191 (0.0019)	0.0105 (0.0016)	0.011 (0.0016)	0.0127 (0.0016)
Tenure ²	-0.0003 (0.0)	-0.0001 (0.0)	-0.0001 (0.0)	-0.0001 (0.0)	-0.0003 (0.0)	-0.0001 (0.0)	-0.0001 (0.0)	-0.0001 (0.0)
Covered×1992	0.0887 (0.0257)	0.0469 (0.0216)	0.0481 (0.0216)	0.044 (0.0215)	0.0837 (0.0269)	0.0448 (0.0227)	0.0444 (0.0227)	0.039 (0.0226)
Covered×1996	0.0921 (0.0325)	0.0593 (0.0274)	0.0581 (0.0272)	0.0538 (0.0272)	0.1093 (0.0458)	0.0663 (0.0384)	0.0706 (0.0382)	0.0708 (0.0381)
Covered×eligible	-0.1509 (0.0211)	-0.0925 (0.0167)	-0.0887 (0.0167)	-0.0738 (0.0168)	-0.1471 (0.0218)	-0.091 (0.0172)	-0.086 (0.0172)	-0.0701 (0.0173)
Eligible×1992	-0.0319 (0.0241)	0.0202 (0.0215)	0.0186 (0.0214)	0.0088 (0.0213)	-0.0383 (0.0255)	0.0176 (0.0232)	0.014 (0.0232)	0.0025 (0.0231)
Eligible×1996	0.0576 (0.029)	0.0636 (0.0252)	0.0585 (0.0251)	0.0433 (0.025)	0.0711 (0.0363)	0.0691 (0.0327)	0.0684 (0.0325)	0.0567 (0.0324)
Covered×eligible× post-1990	-0.0804 (0.029)	-0.0686 (0.0243)	-0.0649 (0.0242)	-0.0516 (0.0241)	-	-	-	-
Covered×eligible× 1992	-	-	-	-	-0.0682 (0.0327)	-0.0636 (0.0277)	-0.0559 (0.0276)	-0.0395 (0.0275)
Covered×eligible× 1996	-	-	-	-	-0.1031 (0.0497)	-0.0778 (0.0417)	-0.0814 (0.0415)	-0.0741 (0.0414)
Other covariates	NO	YES						
Industry dummies	NO	NO	YES	YES	NO	NO	YES	YES
Size dummies	NO	NO	NO	YES	NO	NO	NO	YES
R ²	0.0968	0.3613	0.3668	0.3705	0.0968	0.3613	0.3668	0.03706
N	40,734	40,643	40,631	40,631	40,734	40,643	40,631	40,631

The table reports the coefficient on the level effects and the second- and third-level interaction effects in Eq. (1). Rows (1)–(4) report results of specifications including third-level interactions with a post-1990 dummy which takes the value of 1 if the individual is observed in 1992 or 1996, and 0 otherwise. Rows (5)–(8) report results of specifications including third-level interactions with separate 1992 and 1996 dummies. Covered is a dummy that takes the value of 1 if one's employer paid social security contributions and 0 otherwise. Eligible is a dummy that takes the value of 1 for workers hired after the reform (i.e., workers with less than 5.5 years of tenure in the 1996 June survey and workers with less than 1.5 years of tenure in the 1992 June survey) and 0 otherwise. The additional covariates in Columns (2)–(4) and (5)–(8) include dummies for sex and marital status, education, experience and experience squared, a permanent contract dummy, and seven city dummies. Columns (3), (4), (7), and (8) control for eight industry dummies and Columns (4) and (8) control for firm size dummies for firms with 2–5 employees, 6–10 employees, and more than 10 employees. Robust standard errors are in parentheses.

Table 4

Estimates of the effect of severance payments savings accounts on hourly wages, with parametrized cost of severance payments

	(1)	(2)	(3)	(4)
Severance pay cost× eligible×post-1990	−1.3724 (0.5039)	−1.1035 (0.0243)	−0.9078 (0.4304)	−0.8015 (0.4339)
Other covariates	NO	YES	YES	YES
Industry dummies	NO	NO	YES	YES
Size dummies	NO	NO	NO	YES
R ²	0.114	0.364	0.3711	0.3714
N	40,853	40,760	40,760	40,760

The table reports the coefficient on the third-level interaction effect in Eq. (2). The severance pay cost variable is the share of total severance payment contributions out of total salary payments. Eligible is a dummy that takes the value of 1 for workers hired after the reform (i.e., workers with less than 5.5 of tenure in the 1996 June survey and workers with less than 1.5 years of tenure in the 1992 June survey) and 0 otherwise. The post-1990 dummy takes the value of 1 if the individual is observed in 1992 or 1996 and 0 otherwise. The additional covariates in Columns (2)–(4) include dummies for sex and marital status, education, experience and experience squared, a permanent contract dummy, and seven city dummies. Columns (3) and (4) control for eight industry dummies and Column (4) controls for firm size dummies for firms with 2–5 employees, 6–10 employees, and more than 10 employees. Robust standard errors are in parentheses.

3.3. Individual parametrization of severance payments costs

The NHS allows me to distinguish between covered and uncovered workers, according to who is covered or not by social security contributions, and this is likely to be highly correlated with whether a worker is covered or not by severance pay legislation. However, the NHS does not provide direct information on whether a worker is covered by severance pay legislation. I use the Living Standards Measurement Survey, which was conducted in 1997 and has explicit information on severance pay coverage, to calculate predicted individual-specific severance costs by estimating the probability of severance pay coverage from this data source. I estimate the probability of severance pay coverage as a function of sex, four 10-year age intervals, four education groups, industry dummies defined at the one-digit level, and firm size dummies. Then, I calculate the predicted share of severance costs as follows:

$$SC_i = \frac{Pr(SP_i = 1|X_i) \times \text{Monthly Salary}_i \times \bar{T}_i}{E[\text{Lifetime Salary}_i]}$$

where \bar{T}_i is the average tenure, Monthly Salary_i is the average monthly salary and $E[\text{Lifetime Salary}_i]$ is the expected lifetime salary (i.e., average yearly salary times average tenure) for each sex–age–education–industry–firm size group.

I use this share to estimate the regression above replacing all level and interaction terms with the covered dummy for the predicted share,

$$\ln w_{it} = \alpha_t + \beta'_1 X_{it} + \beta'_2 T_i + \beta_3 SC_i + \beta_{4t} \text{ELIGIBLE}_i + \beta_{5t} SC_i + \beta_6 \text{ELIGIBLE}_i \times SC_i + \beta_7 \text{ELIGIBLE}_i \times SC_i \times \text{POST90}_t + \varepsilon_{it}, \quad (2)$$

where now a coefficient β_7 of -1 would imply a reduction in wages of 1% in response to an increase of 1% in severance payments costs. Table 4 shows the coefficients of the third-level interaction with the post-reform dummy for this regression. The results with basic controls and industry dummies suggest additional shifting of about 90% after the switch from the traditional severance pay system to the system of SPSAs.¹⁷ Controlling for industry and size dummies, though, suggests additional shifting of about 80% of the severance costs to workers in the form of lower wages after the introduction of SPSAs. The results are significant at conventional levels and similar in magnitude to those reported in Table 3.¹⁸

3.4. Potential composition biases

The results in Tables 3 and 4 may be subject to composition biases. If covered firms are less likely to retain unproductive matches after the reform, then the results in Tables 3 and 4 may underestimate the shifting generated by SPSAs. Kugler (1999, 2004) suggests that the reform increased turnover by about 1%, so it is possible that such a downward bias exists. On the other hand, if low skill workers are more likely to be covered by severance pay legislation after the reform because there is more hiring overall after the reform, the results in Tables 3 and 4 could overestimate the shifting generated by the introduction of SPSAs.

Table 1 suggests that the distribution of observable characteristics changed similarly between the pre- and post-reform periods in the covered and uncovered sectors and the change was towards an improvement in the composition of the workforce in both sectors (e.g., higher education). In addition, the hourly wages of uncovered workers in the upper quarter of the distribution were close to the median hourly wage of covered workers during the pre-reform period (i.e., 168 pesos vs. 157 pesos in 1988 terms), suggesting that the movement of marginal workers from the uncovered to the covered sector is unlikely to account for the observed reduction in wages of covered workers eligible for SPSAs during the post-reform period. Finally, the weak explanatory power of the observables in a regression of the third-level interaction term suggests that composition biases are unlikely to be very important.¹⁹

4. Conclusion

This paper assesses the impact of the introduction of a system of severance payments savings accounts (SPSAs) in Colombia after the 1990 Labor Market Reform. A similar system of unemployment insurance savings accounts has been proposed by Feldstein and Altman (1998) and Hopenhayn and Hatchondo (2002) and a similar system of comprehensive welfare accounts by Folster et al. (2002) to reduce the distortionary effects of unemployment insurance and other welfare benefits.

¹⁷ The results without controls and with only basic controls suggest shifting of over 100%. However, the coefficient in the specification with only basic controls is not significantly different from -1 .

¹⁸ I also tried specifications with third-level yearly interactions and the results were similar, though less precise.

¹⁹ The R^2 in this regression is around 0.1.

The Colombian case offers a unique opportunity to study the labor market consequences of savings accounts. This paper examines the wage effects of the introduction of SPSAs in Colombia. Since savings accounts guarantee severance payments and eliminate uncertainty, workers should be more willing to accept wage cuts to assume part of the costs of severance payments. Moreover, SPSAs should reduce employment distortions in the labor market by partially neutralizing government-mandated severance with private transfers between firms and workers.

Do SPSAs allow firms to shift part of the severance payments to workers as lower wages? The results suggest that the introduction of SPSAs shifted between 60% and 80% of firms' contributions into the accounts towards workers as lower wages. This shifting of severance payments towards workers should have reduced costs for employers as well as distortions to hiring and firing.

At the same time, when workers pay for part of the severance cost and are faced with liquidity constraints, the system essentially replaces employer insurance with self-insurance against temporary income shocks: workers reduce consumption while employed to save for periods of nonemployment. This means that while the system of SPSAs may be better when the shock occurs at the level of the firm (such as firm bankruptcy), it may not be as good when workers are faced with idiosyncratic shocks—because it does not pool risk across workers who do and do not separate from their jobs. While it is beyond the scope of this paper, it is interesting to point out that a potential downside of the system of SPSAs introduced in Colombia is that it may provide less insurance against idiosyncratic risk than a traditional severance or unemployment insurance systems (see, e.g., Gruber, 1997; Hamermesh, 1982).

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