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PENSION OBLIGATION BONDS: FINANCIAL CRISIS EXPOSES RISKS

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INTRODUCTION

State and local government officials are facing a perfect storm of problems. On the one hand, the sharp decline in equity markets has resulted in a large increase in underfunded liabilities among state and local pensions. Research suggests that public pensions are now less than 80 percent funded and will require an additional $200 billion spread over the next five years to compensate for the increased shortfall.[1] On the other hand, the recession has cut into state and local tax revenues, limiting the ability of governments to make up these shortfalls. The U.S. Census Bureau reports that second-quarter 2009 tax revenues dropped over 12 percent from the second quarter of 2008.[2]

Historically, governments have turned to two "solutions" for managing their pension commitments in times of fiscal stress.[3] Some governments choose to defer part of their annual contribution to the pension fund. However, some are obligated by statute to make the annual required contribution. In these cases, governments may choose to issue a pension obligation bond (POB) to fund their pension system. This instrument, which is a general obligation of the government, alleviates pressure on the government's cash position and may offer cost savings if the bond proceeds are invested in risky assets through the pension fund that realize a high return.

The use of POBs is controversial, and many state and local governments remain wary of these transactions. Some view POBs as being unfair to future generations, and others see them as overly risky. For example, former New Jersey Governor Jon Corzine

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called POBs "the dumbest idea I ever heard....It's speculating the way I would have speculated in my bond position at Goldman Sachs."[4] Nonetheless, some still see an important role for POBs in the future, especially after the global financial crisis. For example, Standard & Poor's recently said that POBs might offer state and local governments some relief from looming pension costs.[5] Moreover, in 2009, governments from the state of Alaska to San Luis Obispo, California, are once again considering POBs to alleviate some of the financial strain.

As such, this *brief* examines POBs, evaluating whether they represent viable pension financing instruments or are simply a device used by cash-strapped governments.

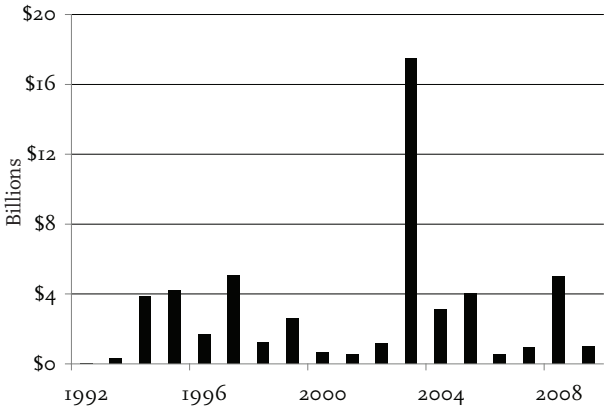
Background

In 1985, the city of Oakland, California, issued the first POB.[6] At the time, POBs offered city, municipal, and state governments a classic arbitrage opportunity. Issued on a tax-exempt basis, the government could immediately invest the proceeds through the pension fund in higher-yielding taxable securities, such as U.S. Treasury bonds, which would lock in a positive net return from the transaction.[7] However, because POBs (and all "arbitrage bonds") deprived the federal government of tax revenues,[8] Congress stopped state and local governments from issuing tax-exempt bonds for the sole purpose of reinvesting the proceeds in higher-yielding securities. Indeed, the Tax Reform Act of 1986 (TRA86), which did away with the tax exemption for POBs, appeared to mark an end for POBs.

Surprisingly, POBs re-emerged in the 1990s. The strong performance of the stock market led some governments (and bankers) to see a potential arbitrage opportunity for *taxable* POBs. Two factors were important. First, taxable interest rates had come down considerably, which meant that POB borrowing costs were lower as well. Second, pension funds had increased their equity holdings substantially over the decade,[9] which generated higher returns for the plans and, thus, led actuaries to assume higher future returns. The combination of these two factors was enough to convince some governments that POBs offered an attractive "actuarial arbitrage."[10]

Since TRA86 and the end of arbitrage bonds, governments have issued billions in taxable POBs. Our data show the trend in new issuances from the early 1990s to July 2009 (see Figure 1).[11] The most notable characteristic is the spike in POB dollars issued in 2003, which is due to a single POB issuance worth almost $10 billion ($12 billion in 2009 dollars) by the state of Illinois.[12]

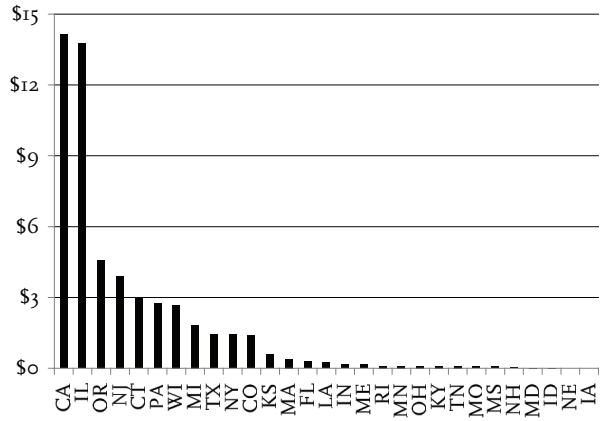
Figure 1. Pension Obligation Bonds Issued from 1992–2009, in Billions of 2009 Dollars



Source: Data set compiled from Bloomberg Online Service.

Even with the anomalous spike in 2003, the total amount of POBs issued in any given year has never been more than 1 percent of the total assets in public pensions. However, certain states and localities are more active in the POB market than others. Figure 2 shows total issuances by state from 1992 to July 2009. It is clear that the bulk of activity in POBs has been centered in only about 10 states, with California and Illinois being major players.[13]

Figure 2. Total Amount of POBs Issued from 1992–2009, by State, in Billions of 2009 Dollars



Source: Data set compiled from Bloomberg Online Service.

Market Drivers

While the market remains small, it is clear that certain jurisdictions see POBs as attractive policy instruments. The available literature suggests two primary reasons for their appeal:[14]

1) Budget relief: During periods of economic stress, governments use POBs for budget relief. State and local governments often face legal requirements to reduce underfunding. With declining revenues, officials may see POBs as the "least bad alternative" among a variety of tough fiscal choices.

2) Cost savings: POBs offer issuers an actuarial arbitrage opportunity, which, in theory, can reduce the cost of pension obligations through the investment of the bond proceeds in higher risk/higher return assets. By commingling POB proceeds with pension assets, the assumption is that bond proceeds will return whatever the pension returns. Given that actuarial practice assumes public pensions will return upward of 8 percent, POBs can be a compelling proposition (especially to governments whose taxable borrowing costs are in the 5 to 6 percent range).

Take, for example, the POB issued by the state of Connecticut in 2008. It had an assumed spread between the asset return and the debt service of roughly 3 percent. According to State Treasurer Denise L. Nappier, "We achieved a favorable borrowing cost of 5.88%, which is well below the 8.5% assumed long-term return on assets...."[15] Thus, the treasurer saw the POB as part of a sound and prudent policy to protect pensioners: "Connecticut is now well on its way to meeting its commitment to its teachers."

Caveat Venditor

While the actuarial arbitrage highlighted above may be persuasive, the issuance of POBs poses serious risks:[16]

1) Financial: The success of POBs depends on the premise that pension returns are on average more than the cost of financing the debt. However, these assumptions may not turn out to be correct, as the recent financial crisis has shown. Even over 15 to 20 years, the duration of most POB debt, interest costs can exceed asset returns.

2) Timing: POBs involve considerable timing risk, as the proceeds from the issuance are invested en masse into the pension plan. Dollar-cost averaging would be the more measured approach to investing large sums of money. Alternatively, some suggest that governments should issue POBs only during recessions, when stock prices are depressed.[17] However, this requires having some sense of what the "top of the market" or the "bottom of the market" looks like.

3) Flexibility: While the issuance of a POB does not change the total indebtedness of the sponsor, it does change the nature of the indebtedness.[18] Requirements to amortize unfunded pension liabilities may be relatively flexible obligations that can be smoothed over time, while the POB is an inflexible debt with required annual payments.

4) Political: If the government uses the POB to fully fund the pension, it may end up with a pension system having more assets than liabilities. Such overfunding may create the political risk that unions and other interest groups will call for benefit increases, despite the fact that the underfunding still exists; it was just moved from the pension plan's balance sheet to the sponsor's balance sheet.[19]

Evidence to Date

In order to assess the extent to which POBs have met issuers' expectations, we calculate the internal rate of return for all POBs issued in a given year. This analysis is based on the universe of taxable POBs issued since the passage of TRA86 through July 1, 2009.[20] The universe includes 2,931 serial POBs issued from 236 different governing entities, totaling approximately $53 billion in 2009 dollars. For each bond, information is available on the date of issuance, the date of maturity, the coupon rate, the par value, and the purchase price as a percent of par.

We begin by looking at each serial bond issued in a given year. The assumption is that the proceeds are invested in accordance with the allocation of the aggregate assets of state and local pensions from the

Federal Reserve's *Flow of Funds* – approximately 65 percent in equities and 35 percent in bonds. Accordingly, we use the S&P 500 total return index and the Barclays 10-year bond total return index to approximate how the POB proceeds have grown over time. For each bond, beginning in year one, we calculate the growth of the invested bond proceeds for that year, then subtract the interest payment (using the stated coupon rate) to get a new beginning balance for the following year, and this process is repeated until the bond matures. For bonds that have not yet matured, the process is repeated until the date of the assessment. At maturity or date of assessment, we compare the ending balance with the initial proceeds to calculate an internal rate of return (IRR). These IRRs are then weighted by the size of the bond in order to calculate an aggregate IRR for each annual cohort of POBs.

The results demonstrate the risk associated with a POB strategy. If the assessment date is the end of 2007 – the peak of the stock market – the picture looks fairly positive (see Figure 3A). On the other hand, by mid-2009 most POBs have been a net drain on government revenues (see Figure 3B). Only those bonds issued a very long time ago and those issued during dramatic stock market downturns have produced a positive return; all others are in the red. While the story is not yet over, since about 80 percent of the bonds issued since 1992 are still outstanding, some may end up being extremely costly for the governments that issued them.

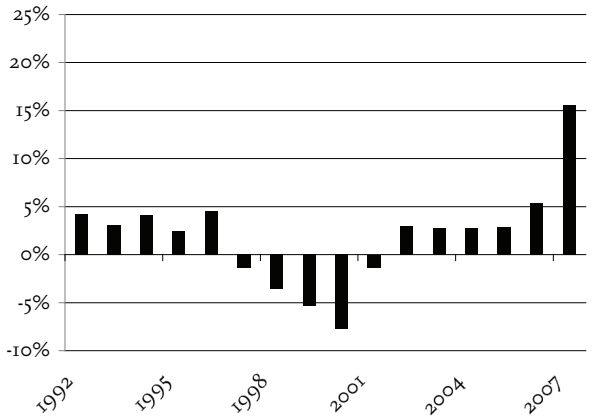
Context Matters

As the analysis of rates of return demonstrates, POBs could well leave plan sponsors worse off than where they were before they issued the POB. As such, it seems clear that in many contexts governments should avoid these bonds.

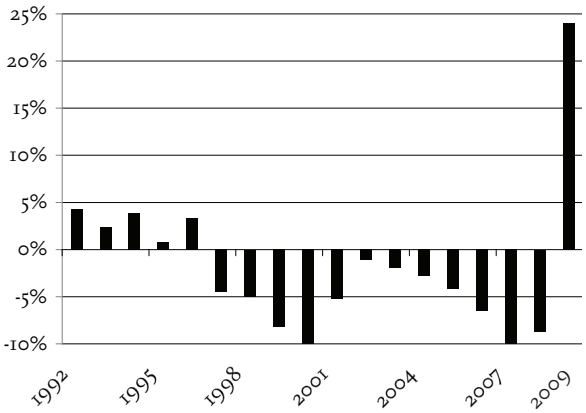
Nonetheless, it is possible to conceive of situations where a POB may still be useful. In theory, governments with well-funded pension plans and sound fiscal health might find POBs advantageous if issued at periods when interest rates are particularly low. This type of issuer could shoulder the additional risk of a POB without jeopardizing its fiscal health. Unfortunately, in practice, the data show that governments with healthy pensions and solid fiscal positions have historically not issued POBs. Rather, the governments that issue POBs are those facing the greatest fiscal stress and thus least able to shoulder the additional risks from a POB. This pattern can be documented by estimating an equation that relates the probability of a government issuing a POB with variables describing the fiscal stress of the issuer.

Figure 3. Internal Rate of Return on Pension Obligation Bonds, by Year Issued

A. Assessed at the Peak of the Market, 1992–2007



B. Assessed Post Financial Crisis, 1992–Mid-2009



Sources: Authors' calculations based on total monthly returns of the S&P 500 from Standard and Poor's Index Services (1992-2009); total monthly returns of U.S. Treasuries from the 2009 Ibbotson SBBI Classic Yearbook (1992-2009); and the Barclays U.S. Treasury 10-year Term Index (2009).

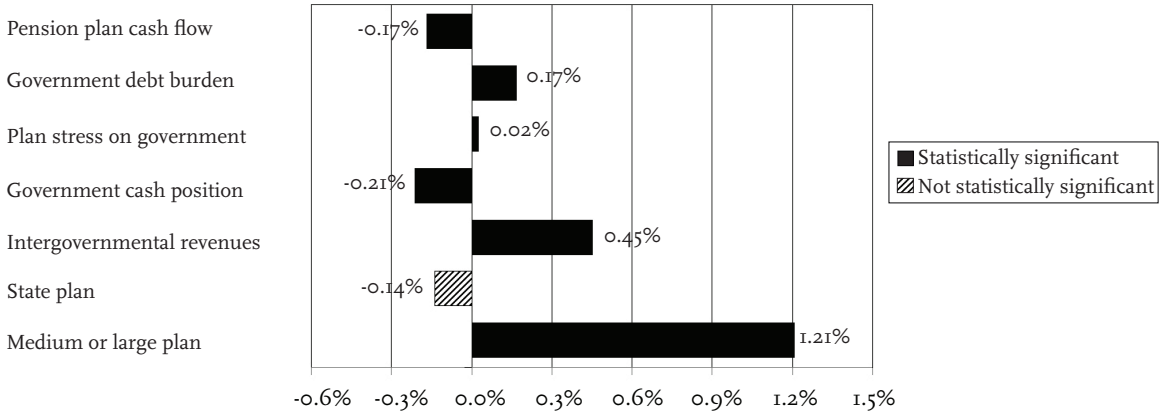
The first step is to construct the dependent variable – a government issuing a serial POB in a given year. This step requires consolidating the multiple POB serial bonds into a single observation. For example, in 1997, the New Jersey state government issued 31 serial bonds; in this exercise, this information is consolidated to indicate that the New Jersey state government was a POB issuer in 1997. This process of consolidation results in 276 observations.

The probability of being one of these 276 entities is then assumed to depend on the characteristics of the government and the pension plan, data on which are available in the *Census of Governments*. These government and pension characteristics are assumed to affect the probability of issuing a POB with a lag. Data constraints determine whether that lag is one year – the preferred and the most frequently used period – or a somewhat longer lag. Even with flexibility on the lag structure, limiting observations to those with complete government and pension data reduces the number of POB issuers from 277 to 94 and the total number of governments with a pension from 16,455 to 10,583.

The specific variables in the model included:[21]

- Pension plan cash flow = the ratio of employee and employer contributions plus investment returns to benefit payments and administrative expense. The assumption is that plans with high ratios would be less likely to issue a POB.
- Government debt burden = government debt as a percent of government revenue. The effect could go either way. A government with substantial debt may find it costly to issue a POB and therefore would not find it profitable. On the other hand, governments with high debt burdens could also be those facing large pension payments for unfunded liabilities, since the government may be more likely to defer pension contributions to make fixed required debt payments.
- Plan stress on government = government contributions to the pension plan as a percent of government revenue. The assumption is that as the pension expenditure increases as a percentage of total government spending, the more likely the government is to issue a POB.
- Government cash position = government cash and securities outside of trusts as a percent of total revenues. The more cash on hand, the less likely a government would be pressed to issue a POB.
- Intergovernmental revenues = the percent of government revenues received as intergovernmental transfers. The assumption is the more that the entity depends on outside revenues, the more likely it is to issue a POB.

Figure 4. Factors Affecting the Probability of Government Issuing a Pension Obligation Bond, 1992–2009



Note: For dummy variables, the effects illustrated reflect a shift from 0 to 1. In the case of continuous variables, the effects illustrated reflect a shift from the 20th to the 80th percentile value of the variable (see Appendix Table A1). For detailed regression results, see Appendix Table A2.
Sources: Authors' calculations based on government financial data and retirement plan data from the U.S. Census Bureau (2009a and 2009b) and POB data from Bloomberg Online Service (2009).

- State plan = 1 if a state government; 0 if local, school, or other district. Since the *Census of Governments* is more likely to have complete data for state plans, the expected coefficient could be positive. On the other hand, localities account for a disproportionately large share of POBs.

- Medium or large plan = 1 if pension assets are greater than $500 million (2007 dollars); 0 if otherwise. Again, the *Census of Governments* is more likely to have complete data for large plans, so the expected coefficient is positive. In addition, larger plans would be more likely to issue a POB, because they could spread the transaction costs over a larger base.

The results show that governments are more likely to issue POBs if they are in financial stress and already have substantial debt outstanding and the plan represents a substantial obligation to the government (see Figure 4 on the previous page). While the magnitudes appear small, they are significant given that only 1.4 percent of governments in our sample issued a POB. In short, the data show that the governments that *could* issue a POB generally have not, while those that *should not* issue a POB have done so.

Conclusion

POBs are taxable general obligation bonds that governments issue to finance pensions. They transfer a current pension obligation into a long-term, fixed obligation of the government. While POBs may seem like a way to alleviate fiscal distress or reduce pension costs, they pose considerable risks. After the recent financial crisis, most POBs issued since 1992 are in the red.

Nevertheless, it appears that POBs have the potential to be useful tools in the hands of the *right governments at the right time*. Issuing a POB may allow well-heeled governments to gamble on the spread between interest rate costs and asset returns or to avoid raising taxes during a recession. Unfortunately, most often POB issuers are fiscally stressed and in a poor position to shoulder the investment risk. As such, most POBs appear to be issued by *the wrong governments at the wrong time*.

Endnotes

1 Center for Retirement Research. 2009. "Analysis of State and Local Pensions in the Wake of the Financial Crisis." Unpublished data.

2 U.S. Census Bureau (2009c).

3 Calabrese (2009).

4 McDonald and Cataldo (2008).

5 Block and Prunty (2008); and Hitchcock and Prunty (2009).

6 Scanlan and Lyon (2006).

7 The decrease in borrowing costs in issuing tax-exempt state and municipal POB bonds often exceeds the differential in the risk premium of state and local bonds over federal bonds of the same duration.

8 See Golembiewski, et al. (1999) for a discussion.

9 See Peng (2004).

10 Bader and Gold (2003).

11 Thad Calabrese generated the POB data set from raw data on government bond issues from Bloomberg.

12 Illinois has just recently been in the news again, as they issued a pension obligation bond for $3.5 billion in January 2010 (McDonald and Cooke, 2010).

13 California and Illinois are, of course, large states. On a per-capita basis, the biggest players are Oregon, Illinois, and Connecticut. California is number six.

14 Burnham (2003); Davis (2006); and Calabrese (2009).

15 Connecticut Office of the State Treasurer (2008).

16 Burnham (2003); Davis (2006); Calabrese (2009); Block and Prunty (2008); and Hitchcock and Prunty (2009).

17 Miller (2009).

18 Hitchcock and Prunty (2009).

19 Government Finance Officers Association (2005).

20 A data set containing only non-federal pension financing bonds issued from 1992 to 2009 was drawn from municipal bond data from Bloomberg Online Service.

21 In addition to the variables described, it would also be useful to include the funding status of the plan. Presumably, poorly funded plans would be more likely to issue a POB. Unfortunately, historical funding data are not available for most plans in the sample.

References

2009 Ibbotson Stocks, Bonds, Bills, and Inflation (SBBI) Classic Yearbook. 1992-2009. *Long Term Government Bonds Total Monthly Returns*. Chicago, Illinois: Morningstar, Inc.

Bader, Lawrence N. and Jeremy Gold. 2003. "Reinventing Pension Actuarial Science." *The Pension Forum* 14(2): 1-13.

Barclays Capital. 2009. *Barclays U.S. Treasury 10-year Term Index*.

Block, Peter and Robin Prunty. 2008. "Time May Be Ripe for a POB Revival." *Standard & Poor's RatingsDirect*.

Bloomberg Online Service. 2009. Proprietary Bond Data.

Burnham, James B. 2003. "Risky Business? Evaluating the Use of Pension Obligation Bonds." *Government Finance Review* 19(3): 12-17.

Calabrese, Thad. 2009. "Public Pensions, Public Budgets, and the Use of Pension Obligation Bonds." Presented at the 2009 Public Pension Fund Symposium, Society of Actuaries.

Center for Retirement Research at Boston College. 2009. "Analysis of State and Local Pensions in the Wake of the Financial Crisis." Unpublished CRR analysis (May). Chestnut Hill, MA.

Connecticut Office of the State Treasurer. April 22, 2008. News Release. "Nappier Announces Landmark Bond Sale."

Davis, Roger L. 2006. "Pension Obligation Bonds and Other Post-Employment Benefits." New York, NY: Orrick, Herrington & Sutcliffe LLP.

GFOA Advisory. March 2005. "Evaluating the Use of Pension Obligation Bonds (1997 and 2005) (DEBT & CORBA)." Washington, DC: Government Finance Officers Association.

Golembiewski, Pat, Gary Bornholdt, and Timothy Jones. 1999. "Allocation and Accounting Regulations for Arbitrage Bonds." Continuing Professional Education Exempt Organizations Technical Instruction Program for FY 1999 Training 4277-050: 135-152.

Hitchcock, David G. and Robin Prunty. 2009. "No Immediate Pension Hardship for State and Local Governments, But Plenty of Long-Term Worries." *Standard & Poor's RatingsDirect*.

McDonald, Michael and Adam Cataldo. 2008. "'Dumbest Idea Ever' Used as Pensions Plug Deficits." Bloomberg.com (May 1, Update 2). Available at: http://www.bloomberg.com/apps/news?pid=20601109&sid=arYeVtZeBd4s&refer=home.

McDonald, Michael and Jeremy R. Cooke. 2010. "Illinois Leads Municipal Sales With Market Set to Extend Rally." Bloomberg.com (January 4).

Miller, Girard. 2009. "Bonding for Benefits: POBs and 'OPEB-OBs': New Strategies to Shatter the Old POB Paradigm." Available at: governing.com.

Peng, Jun. 2004. "Public Pension Funds and Operating Budgets: A Tale of Three States." *Public Budgeting & Finance* 24(2): 59-73.

Scanlan, Matthew H. and Carter M. Lyon. 2006. "The Retirement Benefits Crisis: A Survival Guide." *The Journal of Investing* 15(2): 26-41.

Standard and Poor's Index Services. 1992-2009. *S&P 500 Monthly Returns*.

U.S. Census Bureau. 2009a. *1992-2006 Census of Government Finances and Annual Survey of Government Finances*. Washington, DC. Available at: http://www.census.gov/govs/estimate/historical_data.html.

U.S. Census Bureau. 2009b. *1993-2006 State and Local Government Employee-Retirement System Survey*. Washington, DC. Available at: http://www.census.gov/govs/www/retire.html.

U.S. Census Bureau. 2009c. *Quarterly Summary of State and Local Government Tax Revenue*. (Table 1). Washington, DC.

APPENDIX

Table A1. Summary Statistics of Factors Affecting the Probability of Government Issuing a Pension Obligation Bond, 1992-2009

Variables	Mean	Standard deviation	20th percentile	80th percentile
Pension plan cash flow	306.42	815.87	103.34	366.83
Goverment debt burden	92.69	101.02	27.10	138.76
Plan stress on government	2.57	17.22	0.41	3.39
Government cash position	74.68	83.76	25.26	103.07
Intergovernmental revenues	24.12	17.13	9.34	36.83
State plan	0.06	0.23		
Medium or large plan	0.15	0.36		
Number of observations	10,583			

Source: Authors' calculations.

Table A2. Factors Affecting the Probability of Government Issuing a Pension Obligation Bond, 1992-2009

Variables	Marginal effect
Pension plan cash flow	-0.001 %***
	(0.003)
Government debt burden	0.002 %*
	(0.072)
Plan stress on government	0.008 %**
	(0.026)
Government cash position	-0.003 %**
	(0.027)
Intergovernmental revenues	0.016 %***
	(0.000)
State plan	-0.137 %
	(0.422)
Medium or large plan	1.206 %***
	(0.003)
Pseudo R2	0.1174
Number of observations	10,583

Note: Standard errors are in parentheses and adjusted for within-plan correlation. The model includes year fixed effects. The coefficients report marginal effects from a probit estimation computed at sample means of the independent variables and significance at the 90 percent (*), 95 percent (**), or 99 percent (***) level. The dependent variable is 1 for governments that issued a POB in a given year; 0 otherwise.
Source: Authors' calculations.

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