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NBER Working Paper No. 9479, February 2003, forthcoming in C.M. Reinhart, C. A. Végh and A. Velasco, eds. *Capital Flows, Crisis, and Stabilization: Essays in Honor of Guillermo A. Calvo*.

[8] For a fuller discussion, see G.L. Kaminksy and C.M. Reinhart, "The Twin Crises: The Causes of Banking and Balance-of-Payment Problems," *American Economic Review*, 89 (3), (June 1999), pp. 473-500.

[9] I have documented the typical policy responses in C.M. Reinhart and V.R. Reinhart, "Some Lessons for Policy Makers Who Deal with the Mixed Blessing of Capital Inflows," in M. Kahler, ed., *Capital Flows and Financial Crises*, Council on Foreign Relations Book, Ithaca, NY: Cornell University Press, 1998, pp. 93-127.

[10] This is discussed in C.M. Reinhart and V.R. Reinhart, "On the Use of Reserve Requirements in Dealing with the Capital-Flow Problem," *International Journal of Finance and Economics,* 4 (1), (January 1999), pp. 27-54.

[11] A survey of the literature on capital controls is provided in N. Magud and C.M. Reinhart, "Capital Controls: An Evaluation" in S. Edwards, ed., *International Capital Flows*, forthcoming from the University of Chicago Press.

[12] C.M. Reinhart and R.T. Smith, "Temporary Controls on Capital Inflows," NBER Working Paper No. 8422, August 2001, and *Journal of International Economics,* 57 (2), August 2002, pp. 327-51.

Prospects for Social Security Reform in the United States

Kent Smetters*

One of the most far-reaching shifts in fiscal policy around the world during the past two decades has been the fundamental restructuring of public pension systems. Over two dozen countries across five continents have converted at least part of their pay-as-you-go, defined-benefit, public pension systems into systems based on funded, defined-contribution accounts. Several additional countries are currently in the process of conversion, and even more countries, including the United States, are debating it.

The shift toward defined-contribution plans in the *private* sector has increased the mobility of workers, because traditional defined-benefit plans have a "lock-in effect" that discourages employees from switching employers. Therefore, the conversion of *public* pension plans to the defined-contribution model sometimes has been lumped together as part of this same "modernization" movement. However, that explanation is problematic, because public pension plans are typically already fairly portable across employers. With a few exceptions, the public pension benefit formula in most countries is dependent on the wages of the worker regardless of the actual employer.

In fact, the public plan conversions seem fairly puzzling at first. To be sure, many common arguments have been put forth in favor of "personal accounts" including the potential to earn higher rates of return in equities, increased national savings, as well as greater bequeath-ability. However, even if we believed that a portion of the equity premium were a "freebie" and not just a compensation for risk, higher returns could be earned by a public pension system by investing in equities, which has the added benefit of potentially improving risk sharing across generations.[1] National saving also could be increased by pre-funding the traditional pension system. The traditional pension scheme also could be complemented with a life insurance payment upon death that replicated the bequeath-ability aspect of personal accounts.

Indeed, in a deterministic setting, the traditional public defined benefit pension systems in theory could achieve the same economic objectives as personal accounts. In the presence of idiosyncratic risks, traditional defined-benefit systems more easily allow for sharing wage and longevity uncertainty.[2] Relatively larger transaction costs in defined contribution plans, as well as problems associated with financial literacy, moral hazard, and adverse selection, only seem to buttress the case for the traditional design. So why are more and more countries abandoning the traditional design for the funded, defined contribution model that, in theory, is no better than the traditional design and potentially even worse?

Adding to the puzzle is that these reforms have taken on numerous shapes and sizes across the world. While, politically, the adoption of personal accounts are often linked to demographic concerns (for example, retirement of baby boomers in the United States), the actual evidence does not seem to support this motive for personal accounts. Indeed, the *largest* reforms occurred in less developed countries where future demographic problems are projected to be the *least* severe, including Chile (1981), Columbia (1993), Peru (1993), Mexico (1997), Bolivia (1997), El Salvador (1998), and Kazakhstan (1998). In each of these countries, the vast majority of the final expected retirement benefit is

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derived from income produced by assets held in the new defined-contribution accounts. In contrast, more modest reforms occurred in countries with higher per-capita incomes where demographic problems are more severe, including Switzerland (1985), the United Kingdom (1986), Denmark (1990), Australia (1992), Argentina (1994), China (1995), Uruguay (1996), Hungary (1998), Sweden (1998), and Poland (1999). These countries have adopted systems that blend defined contribution accounts with a defined benefit. Some countries with the most serious demographic problems, including Germany and Japan, have passed only minor reforms. So, why are the largest reforms appearing in countries with the least amount of demographic problems?

One central theme appears to emerge that might help to explain these puzzles: the public pension conversions appear to represent a fundamental distrust in the ability of the government to provide secure retirement resources.[3] The exact nature of the distrust, though, differs between developing and developed countries, consistent with the differences in the magnitudes of pension reforms.

Traditional pay-as-you-go pension systems require a significant amount of trust between workers of different generations — the so-called "social contract." The median voter who supports a pay-as-you-go pension system is typically a middle-aged worker: she has no incentive to support a system that might not be viable when she is retired.

In developing countries, where reforms have been the largest, the distrust in the government provision of public pensions appears to be conditioned on past downward movements in the real value of benefits (often caused by inflation), misuse of retirement resources, and other risks and inequities in the pre-reform public pension systems. Workers in developing countries don't trust the government to run even a strict pay-as-you-go system. Funded defined-contribution accounts, therefore, give workers an independence from the government. The concomitant increase in the level of funding is not the primary objective of reform but simply a necessary byproduct of securing a safer retirement income independent of the substantial level of trust required by a pay-as-you-go financed scheme. Personal retirement accounts in these countries probably would have been created even without demographic concerns.

In contrast, in developed countries, where reforms have been smaller, previous downward benefit adjustments and inequities, while existing, have been less important. Instead, the primary objective in these countries *is* to pre-fund future benefits since many of these countries face more severe demographic problems. Partial pre-funding of future benefits avoids more drastic changes, whether benefit cuts or tax increases, down the road. However, the governments in these countries are not trusted enough to properly save or invest the required additional resources. So, in developed countries, the creation of personal accounts is a byproduct of attempts to increase funding. But the reforms are smaller because they are mainly motivated by demographics. If these countries faced no demographic pressures, the incentive to partially privatize would be greatly reduced.

The United States

According to the 2005 Social Security Trustees' Report, the U. S. Social Security system currently faces a shortfall equal to about $11.1 trillion, which is equal to the present value of all future projected benefits minus the present value of all future projected payroll taxes after subtracting the value of the trust fund.[4] This shortfall is equal to about 3.5 percent of future payroll. The shortfall in the Medicare program, including the commitments on general revenue, is about seven times larger. Absent benefit cuts, placing Social Security and Medicare on a permanently sustainable course could hypothetically be achieved by increasing payroll taxes from their current rate of 15.3 percent of wages to about 36.1 percent of wages — immediately and forever. For each 5 years in which action were delayed, the required immediate and permanent payroll tax hike increases by about 10 percent, or by about 1.5 percent of wages.

These calculations, however, unrealistically and optimistically assume that people continue to work and earn just as much as before the change in fiscal policy. New empirical evidence by Prescott (2004), though, suggests otherwise: he attributes the sizable difference in the average number of working hours per worker in the United States versus many European countries to the differences in tax rates, largely used to finance state-based retirement benefits.[5] Even using a much smaller labor supply elasticity than implied by his study, raising payroll taxes could substantially reduce household savings and output relative to controlling the growth rate of Social Security benefits.[6]

Personal accounts themselves, however, don't improve or worsen Social Security's financial outlook. Contrary to some proponents, personal accounts don't offer a "free lunch" by reducing Social Security's shortfall. At the same time, contrary to many opponents, personal accounts, when designed similarly to President Bush's recent proposal, don't add an additional burden to the Social Security system. The appearance of "transition costs" from creating personal accounts simply reflects the fact that the federal cash-flow budget system fails to account for the long-term liabilities in the nation's entitlement programs.[7] While the diversion of payroll taxes to personal accounts increases the amount of debt held by the public, the unfunded obligations in the Social Security program are reduced by an equal amount in present value. The federal budget tracks the increase in the debt but not the concomitant reduction in obligations.

The Social Security Trust Fund

Currently, the Social Security system collects more in revenue than it pays in benefits. The excess is placed into the Social Security Trust Fund. The Trustees currently project that outlays will begin to exceed revenue around 2017, at which time the Trust Fund will be tapped in order to pay

benefits. The Trust Fund is projected to become depleted around 2041, after which only about 74 percent of benefits can be paid.

Central to the debate on how to reform Social Security is whether the Social Security trust fund really represents a "store of value." To be sure, the assets in the Trust Fund are "real" in the sense that the U.S. Treasury will honor the claims made by the Social Security Administration. But the relevant question is whether Congress really uses Trust Fund surpluses to reduce the amount of debt held public, thereby increasing the government's ability to pay future benefits. Or, does Congress simply use Trust Fund surpluses to hide *additional* spending or tax reductions elsewhere in the federal budget? Congress is potentially able to mask larger non-Social Security deficits because the federal unified budget combines the Trust Fund surpluses with non-Social Security deficits even though, as a pure technicality, Social Security is officially "off budget."

If Trust Fund surpluses are partly hiding fiscal looseness elsewhere in the budget then diverting future Social Security surpluses to personal accounts might require more fiscal restraint on policymakers in the future, that is, personal accounts may be a superior "lock box." Keeping the money away from politicians, though, trades one risk for another, namely, keeping the money away from pensioners *before* they retire. Nonetheless, personal accounts would likely improve the informational content of government spending.

It is not hard to find Republican and Democrats who believe that Congress routinely "spends the Trust Fund" whenever Congress runs a unified deficit. But if Congress would have run the same "on budget" deficits (excluding Social Security) without Trust Fund surpluses then the Trust Fund surpluses were actually *saved*.

Empirically, over the passed six decades, "on budget" (non-Social Security) and "off budget" (Social Security) surpluses have been uncorrelated, which appears to suggest that Trust Fund surpluses have not been used to hide non-Social Security deficits. However, macroeconomic shocks and changes in attitudes over time toward the size of government would tend to create an upward bias (positive correlation). When controls for these factors are added to the regression model, the correlation turns negative and statistically significant even at the 2 percent level over the entire sample period.[8] In fact, the results suggest that the *entire* Trust Fund buildup since 1983 has been used to hide *additional* spending or tax reductions elsewhere in the budget. It appears that Trust Fund surpluses failed to reduce the debt held by the public!

Probably the most suggestive indication that Congress has routinely used Trust Fund surpluses to mask larger non-Social Security deficits is the evidence of a structural break when unified budget accounting was adopted in 1970. Before 1970, Trust Fund surpluses certainly existed, although they dwindled over time as Congress increased the generosity of benefits during the 1970s. But there is no evidence that Congress used Trust Fund surpluses to hide larger deficits elsewhere in the budget before 1970. The evidence only appears after the adoption of the unified budget accounting scheme.

Social Security Privatization with Second Best Taxes

It is generally believed that allowing workers to divert a portion of their pay-as-you-go payroll taxes to private accounts would require levying a new tax in order to continue to pay the Social Security benefits of those retired at the time of privatization. In other words, privatization simply substitutes one distorting tax for another, producing no efficiency gains. This conventional wisdom, though, is based on the standard life-cycle model with just two periods.

Recent research, using a multi-period life-cycle model, has shown how to privatize in a way that reduces labor supply distortions to current and future generations without hurting initial retirees — a Pareto improvement.[9] The two most common methods of privatization fail to reduce distortions, though, because, ironically, they provide "transition relief" in an effort to protect the value of previous contributions. *Partial* transition relief, however, can lead to Pareto gains.

Upon extending the life-cycle model to three or more periods, a household's accrued benefit — which is observable by the government — becomes a source for an efficient implicit lump sum tax that can be used to replace some future revenue that would have been collected from that household using a distorting labor income tax. Equivalently, this implicit wealth levy can afford participants a higher return on their future contributions, thereby reducing the effective tax rate on their labor supply. A back-of-the-envelope calculation suggests that the efficiency gains for the United States could exceed $1 trillion, although this calculation should be interpreted with some caution because it ignores the transaction and other costs associated with personal accounts.

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[1] If Social Security purchased equities with its excess contributions, risk sharing could be potentially improved across generations. See H. Bohn, "Should the Social Security Trust Fund hold Equities? An Intergenerational Welfare Analysis," *Review of Economic Dynamics*, 2 (3) (July 1999), pp. 666-97. It is possible to replicate this same effect using a capital income tax without direct government ownership. See K. Smetters, "The Equivalence of the Social Security's Trust Fund Portfolio Allocation and Capital Income Tax Policy," NBER Working Paper No. 8259, April 2001.

[2] S. Nishiyama and K. Smetters, "Does Social Security Privatization Produce Efficiency Gains?" NBER Working Paper, forthcoming.

[3] K. Smetters and C. Park, *A Matter of Trust: Understanding A Matter of Trust: Understanding Worldwide Public Pension Conversion*, in progress.

[4] The 2005 OASDI Trustees Report, Table IV, B6.

[5] E. Prescott, "Why Do Americans Work More than Europeans?" *Federal Reserve Bank of Minneapolis Quarterly Review*, 28 (1) (July 2004), pp. 2-13.

[6] L.J. Kotlikoff, K. Smetters, and J.

Walliser, "Finding a Way Out of America's Demographic Dilemma," NBER Working Paper No. 8258, April 2001.

[7] See the discussion in J. Gokhale and K. Smetters, "Measuring Social Security's Financial Problems," NBER Working Paper No. 11060, January 2005.

[8] K. Smetters, "Is the Social Security Trust Fund Worth Anything?" *American Economic Review (Papers and Proceedings*), 94 (2) (May 2004) pp. 176–81. Also see, S. Nataraj and J.B. Shoven, "Has the Unified Budget Undermined the Federal Government Trust Funds?" NBER Working Paper No. 10953, December 2004.

[9] K. Smetters, "Social Security Privatization with Elastic Labor Supply and Second-Best Taxes," NBER Working Paper No. 11101, February 2005.

Behavioral Finance

Jeremy C. Stein*

Much of my research over the last several years has been in the broad area of behavioral finance. Some of this work investigates the beliefs of less-than-fully rational investors — the valuation models they use, and the particular sources of information that they pay attention to. Another part focuses on the constraints that professional arbitrageurs face because of the agency problems inherent in delegated money management. Finally, a third strand explores the connection between investor irrationality and corporate-finance outcomes.

Simple Models

In attempting to make even the most basic kinds of forecasts, we can find ourselves inundated with a staggering amount of potentially relevant raw data. A large literature in psychology suggests that people simplify such forecasting problems by focusing their attention on a small subset of the available data. One powerful way to simplify is with the aid of a theoretical model. A parsimonious model will focus the user's attention on those pieces of information deemed to be particularly relevant for the forecast at hand; the user will disregard the rest. For example, an investor with an "honest-accounting" model of the world who examines a firm's annual report may focus on earnings per share, while ignoring much of the other material in, say, the footnotes.

Of course, even people who use very simple models are likely to give up on these models when they fare poorly — as the honest-accounting model is likely to have done in recent years — and to move on to alternatives. Motivated by this idea, Harrison Hong and I study the implications of learning in an environment where the true model of the world is multivariate, but in which agents update only over the class of simple univariate models.[1] If a particular simple model does a poor job of forecasting over a period of time, it is eventually discarded in favor of an alternative — yet equally simple — model that would have done better over the same period. This theory makes several distinctive predictions. For example, it suggests that a high-priced glamour stock has particularly low conditional expected returns, and particularly high conditional volatility, in the wake of recent bad news about fundamentals, because this high-price/bad-news configuration suggests that the potential for a "paradigm shift" among investors is elevated.

In a related vein, Philippe Aghion and I examine a setting in which a firm can devote its efforts either to increasing sales growth or to improving per-unit profit margins, for example by cutting costs.[2] If the firm's manager is concerned with the current stock price, she will tend to favor the growth strategy when the stock market is following a valuation model that pays more attention to performance on the growth dimension. Conversely, it can be rational for the stock market to weight observed growth measures more heavily when it is known that the firm is following a growth strategy. This two-way feedback between firms' business strategies and the market's valuation model can lead to purely intrinsic fluctuations in sales and output, creating excess volatility in these real variables even in the absence of any external source of shocks.

Local and Social Influences on Investment Decisions

A number of recent papers show that investors tend to have a strong local bias in their portfolio choices. This bias shows up not only as a preference for domestic as opposed to foreign stocks, but perhaps more strikingly as a preference for those domestic stocks that are headquartered close by.[3] While the existence of within-country local bias now seems to be incontrovertible, there is little evidence to date regarding its equilibrium asset-pricing implications.

Hong, Jeffrey Kubik, and I explore these asset-pricing effects.[4] We begin by constructing a variable we call RATIO which, for any given region at any point in time, is equal to the aggregate book value of all firms headquar-

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