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Public Pensions are Underfunded

The extent to which public pensions are underfunded has been obscured by governmental accounting rules, which allow pension liabilities to be discounted at expected rates of return on pension assets, according to NBER researchers **Robert Novy-Marx** and **Joshua Rauh**. In **The Intergenerational Transfer of Public Pension Promises** (NBER Working Paper No. 14343), they report that over the next 15 years, state pensions are expected to grow to a total of about \$7.9 trillion. But Novy-Marx and Rauh conservatively estimate a 50 percent chance that the system will be underfunded by more than \$750 billion at that time, and a 25 percent chance of a shortfall of at least \$1.75 trillion (in 2005 dollars). “Adjusting for risk, the true intergenerational transfer is substantially larger,” they write. “Insuring both taxpayers against funding deficits and plan participants against benefit reductions would cost almost \$2 trillion today, even though governments portray state pensions as almost fully funded.”

Novy-Marx and Rauh collected data on the largest defined benefit (DB) pension funds sponsored by U.S. state governments. In a typical DB pension plan, an employer pledges an annual pension payment of an amount that is a function of the employee’s final salary and years of employment. To assemble the list of plans, the authors began with

data from the Census of Governments published by the U.S. Census Bureau. They studied all plans with more than \$1 billion of assets. There were 112 such plans at the end of 2005. They then examined the Comprehensive

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Annual Financial Report (CAFR) for each pension plan and collected total actuarial liabilities for each, along with the discount rate used by state actuaries to calculate these liabilities.

States back pensions with stocks, bonds, cash, private equity, real estate, and hedge fund exposure. But the typical investment strategies, in conjunction with accounting rules, make the pension funding situation look much better than it actually is. Under the government accounting logic, states always could eliminate their underfunding, no matter how large, simply by investing in sufficiently risky assets. In fact, investing in riskier assets may raise expected returns, but it also increases the probability of a severe underfunding. Under current investment strategies and a standard equity premium of 6.5 percent, there is a two-thirds chance that state pension plans will realize a shortfall in 15 years. The expected conditional shortfall is almost \$1.5 trillion in 2005 dollars.

Under any plausible discounting assumptions that reflect the true present value of state pension promises, the underfunding in state pension plans is larger than the total magnitude of outstanding state bonds. If state pension

promises were riskless, the underfunding would amount to \$1.9 trillion. If the risk of state pension liabilities were roughly captured by municipal borrowing rates excluding the tax benefit, which allows for a possibility of defaulting on these pension liabilities, Novy-Marx and Rauh find that total state underfunding amounted to \$862 billion as of late 2005.

All of the figures described above assume that all pension benefits that will be accrued in the future will be fully funded using appropriate discount rates, which Novy-Marx and Rauh demonstrate has not been the case in the recent past. The figures also do not account for other post-retirement employee benefits (OPEBs), which total \$380 billion in present value. Therefore, the analysts’ calculations probably understate the extent of the funding crisis.

— Matt Nesvisky

The Unequal Geographic Burden of Federal Taxation

In the United States, workers in cities offering above-average nominal wages pay 30 percent more in federal taxes than otherwise identical workers in cities offering below-average wages. In **The Unequal Geographic Burden of Federal Taxation** (NBER Working Paper No. 13995), author **David Albouy** estimates that federal taxes lower long-run employment levels in high-wage areas by 15 percent, depress land prices there by 25 percent, and reduce housing prices in the area by 4 percent. Economists term these negative outcomes “locational inefficiencies,” and Albouy estimates that they cost taxpayers \$34 billion in 2005.

In the United States, highly taxed areas tend to be in large cities inside of

populous states. Albouy conjectures that their higher tax burdens may be a reflection of their relatively low Senate

by providing deductions.

The President’s Advisory Panel has recommended setting mortgage deduc-

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representation and later Presidential primaries. The taxpayers in these highly taxed states often claim larger deductions than their counterparts in states with lower federal taxes. While these deductions may help workers to locate more efficiently, their effect is not strong enough to offset the consumption inefficiencies that are caused by higher nominal incomes and correspondingly higher taxes. Locational efficiency is easier to achieve by indexing taxes than

tion caps according to local prices, but that proposal, like proposals to index federal tax brackets to local cost-of-living measures, would be difficult to implement. Allowing the mortgage deduction limit to vary by place would, in addition, do little to help those who do not itemize their deductions. Such non-itemizers represent a significant proportion of those affected by the federal tax disparity.

—Lester Picker

Having Good Teeth Can Pay Off

Is good oral health valued in the labor market? In **The Economic Value of Teeth** (NBER Working Paper No. 13879), co-authors **Sherry Glied** and **Matthew Neidell** exploit variation in access to fluoridated water during childhood—protecting children from cavities and possible tooth loss later in life—to answer that question. Fluoride has been shown to reduce cavities in teeth by as much as 60 percent. Municipal water fluoridation, “one of the 10 greatest public health achievements of the twentieth century” according to the U.S. Centers for Disease Control, began in Grand Rapids, MI, in 1945. It spread slowly throughout the United States, without any apparent relationship to wages or family income at the time it was introduced.

The authors find that “women who resided in communities with fluoridated water during childhood earn approximately 4 percent more than women who did not, but [there is] no effect

of fluoridation for men.” The “much smaller and statistically insignificant” effect of fluoridation on the hourly earnings of men is consistent with Glied and

among other things, that their results support the “Beauty Myth” argument: that women are held to different standards of physical appearance from men.

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Neidell’s hypothesis that: 1) women are more likely to be affected by consumer or employer discrimination on the basis of appearance; and 2) that women are more likely to select into occupations based on their physical appearance. When the authors introduce statistical controls for occupational sorting, the effect of fluoride on wages is reduced by only 6 percent. It is not affected by the inclusion of statistical controls for self-esteem or depression. The authors estimate that losing one tooth results in an annual earnings loss of \$720/year for a typical urban woman working full-time for a wage of \$11/hour. They conclude,

Glied and Neidell also find that the benefits of fluoridation are concentrated among women with low social economic status (SES). This is not surprising, they reason, because those individuals “are less able to respond to health shocks (such as decayed teeth)” than high-SES individuals, who also get more preventive dental care. The authors also note that data from a government survey for 1986–7 indicate that 38 percent of black children have either untreated tooth decay or at least one missing tooth, while only 20 percent of white children do.

—Linda Gorman

Capital Inflows and Reserve Accumulation

As global capital flows have intensified over the past decade, many emerging market nations have tried to keep their currencies from appreciating against the U.S. dollar. They use a wide variety of tools to accomplish that feat. By trying to maintain autonomy over their exchange rates, these countries' monetary officials appear to want to "have their cake and eat it, too," according to **Carmen Reinhart** and **Vincent Reinhart** in **Capital Inflows and Reserve Accumulation: the Recent Evidence** (NBER Working Paper No. 13842). "[A]uthorities seem reluctant to be bound by the iron triangle of international finance that holds only two of the following three can be achieved: freely mobile capital, fixed exchange rates, and monetary autonomy," the authors write.

For this study, the Reinharts examined the major policy initiatives in more than 100 emerging market countries. Often, these nations ended up accumulating foreign reserves, many times causing them to raise reserve requirements in order to blunt the economic effects of holding so much foreign money. When the authors looked at the monthly changes in the exchange rate and foreign-currency reserves for 97 developing countries from 1990 to 2006, they found that most of the countries' exchange rates varied less than the currency swings of the developed nations they were benchmarking: Australia, Japan, and the United States. And, the developing nations' foreign exchange reserves generally varied more than those of the benchmark countries.

For example, seven of every ten emerging nations studied had more muted swings in their exchange rates and more pronounced swings in their reserves than Australia. Only 4 percent of the emerging nations allowed the opposite phenomenon — more variable exchange rates and less variable reserves than their benchmark.

One of the emerging nations' chief

concerns is a rapid inflow of foreign capital, which can distort local markets, expose and increase weaknesses in the domestic banking and investment industries, or fuel an asset-price bubble. But monetary authorities have various tools to discourage such inflows, or at least to dampen their effects.

In theory, the simplest mechanism is to tie local interest rates to those of

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the United States or another benchmark country, so that foreign investors never see a comparative advantage in investing in the developing country rather than the benchmark. In practice, that can be difficult to do, because that advantage hinges not just on interest rates but also on investor perceptions of risk in both countries, the authors explain. "Thus, the domestic rate may have to change with changes in the perceived default rate and the risk premium, two variables that must be inferred, not observed."

Another way to discourage capital inflows is to raise taxes on the assets that foreign investors might buy. But some research suggests that investors could perceive those taxes as a way to keep assets for local investors, meaning that the government sees the assets as even more valuable. "If that is the case, then foreign investors may just pile more capital into the country," the authors write.

If governments can't stop capital inflows, then at least they can try to balance them by encouraging their citizens to export their capital. They can do this by lowering the tax on foreign assets, but only if one exists in the first place.

A fourth option is to sterilize the inflows — in effect, mopping up all the foreign money coming in by selling government bonds. That keeps the domestic money supply from becoming bloated. But in many cases, coun-

tries appear not to sterilize the inflows and to instead raise reserve requirements (in reality, this is another form of sterilization) on banks that take excess money and lend it out. Raising the percentage that banks have to hold as reserves on loans acts as a tax on the banking system, as long as reserves don't accrue interest at a competitive rate, the authors write. "Changes in that tax

can have real effects, including on the exchange rate, depending on the incidence of the tax."

Indeed, developing nations have been accumulating massive amounts of reserves. The International Monetary Fund projects that as a group their reserves will grow by \$3–4 trillion in each of the next few years. To see whether those reserves were growing through sterilized or unsterilized means, the authors looked at international reserves and the domestic money stock for 30 non-industrial economies from 2000 to 2006. "Quite clearly, international reserves did not leave a material imprint on the domestic money stock in the early years of this decade.... In the most recent years, though, authorities apparently have found it difficult to offset their massive purchases," the authors write, and the rate of increase in money supply drifted up.

This study looked at official actions related to exchange rates in more than 100 nations over the past decade. The authors found a wide variety of actions, suggesting that there is no single policy tool. For example, Croatia, South Korea, and Vietnam boosted their reserve requirements in the past few years. The People's Bank of China did it six times in the first seven months of 2007 alone. Others, including Australia, Denmark, El Salvador, Hong Kong, Sweden, and Switzerland, did not. A

handful of countries have given up completely on having an independent mon-

etary policy, including Brunei, Hong Kong, and Ecuador, which has adopted

the U.S. dollar as its own currency.

— Laurent Belsie

Latin American Industrialization after 1870

Brazil and Mexico enjoyed faster industrialization after 1870 than did the rest of Latin America and much of what we now call the Third World. In **Was It Prices, Productivity or Policy? The Timing and Pace of Latin American Industrialization after 1870** (NBER Working Paper No. 13990), authors **Aurora Gómez Galvarriato** and **Jeffrey Williamson** try to determine how much of this economic performance was attributable to each of three factors: changing fundamentals, such as improving economic institutions and greater political stability, both of which would have facilitated greater technology transfer and accumulation; changing market conditions, such as more expensive manufactures and cheaper foodstuffs; and changing policies, such as pro-industrial real exchange rate and tariff policies.

They begin their analysis by examining textile production, which always dominates manufacturing during early industrial stages. Between 1800 and the 1870s, Mexico was flooded with cheap, factory-made European textiles,

and thus lost a lot of its home market: the share of the domestic textiles market supplied by local firms fell from 79 percent in 1800 to 60 percent in 1879, a

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classic example of globalization-induced de-industrialization. After the 1870s, the local firms won back what they had lost, their share rising to 78 percent shortly before 1910. Brazilian industrialization was also impressive during these four decades, and both of these young republics did well compared with the rest of the poor periphery.

While protectionist policies did serve to offer modest support for some local industries, the impact was small. Instead, the authors find, trends in the net barter terms of trade (the price of exports over imports) made a much bigger contribution. This long-term trend in world relative prices worked in favor of industrialization in certain

Latin American young republics, especially when compared to other poor nations in the Middle East, South Asia, and East Asia. The fall in the net bar-

ter terms of trade in Mexico, Brazil, and Venezuela implied a rise (or at the very least, no fall) in the relative price of imported manufactured goods, a trend that obviously favored domestic industry there.

The authors find that improved wage competitiveness did not make a significant contribution to domestic industrialization in most of Latin America, including Mexico, but it did favor industry in Brazil and Uruguay. Some part of the industrial lift-off in Brazil and Mexico can also be explained by real exchange rate depreciation prior to 1913, but this explanation does not apply to Argentina, Chile, or Colombia.

— Lester Picker

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