

# Do the Markets Care about the \$2.4 Trillion U.S. Deficit?

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*If the U.S. federal government properly accounted for its explicit and promised liabilities, it would record a national debt of \$64 trillion and a national deficit of \$2.4 trillion in 2006. Although capital markets seem to care about the officially reported budget deficit—a metric that is backward looking and quite misleading—the markets have done little more than yawn at the federal government's mammoth, and growing, forward-looking budget imbalance. Are investors uninformed? They should remember that the common belief that capital markets cannot fail is precisely the reason why they can.*

**T**he U.S. federal government's current method of accounting makes that of former Enron Corporation look almost pristine.

The long-term imbalances in the nation's entitlement programs, including Social Security and Medicare, are not integrated with the rest of the budget, although in the private sector, ignoring retiree health and pension programs would be illegal. If the federal government properly accounted for its explicit and promised liabilities, it would record a national debt of \$63.7 trillion in 2006 and a national deficit of \$2.4 trillion.

Politicians may be able to hide this bad news from media outlets, but they should have a harder time fooling the capital markets. There, investors place bets on the basis of their best guesses as to future investment returns, which are heavily influenced by prospective fiscal policies. Nonetheless, although the capital markets seem to care about the officially reported budget deficit—which is backward looking and highly misleading—the markets seem to have done little more than yawn at the federal government's mammoth, and growing, forward-looking budget imbalance. The recent retiree prescription drug law, for example, added more than \$15 trillion to the federal government's shortfall, but its passage had no appreciable effect on long-term interest rates.

Are capital markets uninformed? Or do investors naively think (hope) that Washington will eventually rein in the \$63.7 trillion shortfall without

hurting the capital markets? Or do investors seem aloof to these long-term financial problems for some rational reason?

We argue that, although rational answers to the questions appeal to economists, the possibility of an Argentina-type meltdown cannot be dismissed. *The common belief that capital markets cannot fail is precisely the reason why they can.* Of course, the United States is not Argentina. Yet, the United States has never faced anything close to the unbalanced balance sheet it now confronts—not even during World War II.

## Some Frightening Arithmetic

The oldest Baby Boomers will attain Social Security's early-retirement age of 62 in 2008 and will become eligible for Medicare benefits by 2011. As this generation enters retirement, the retirees' share of the population will climb rapidly, increasing from about 20 percent today to 37 percent by 2035. Projected longevity improvements mean that retirees' population share will continue to increase gradually during the remainder of this century. This ongoing and irreversible process of population aging in the United States will, under current policies, exert tremendous pressure on the federal government's budget and produce large cash shortfalls.

To calculate the present value of the federal government's imbalance, we constructed a detailed distribution of federal taxes and transfers by age and gender and developed a method for projecting federal discretionary spending. The analysis is based on micro-data surveys as described in Gokhale and Smetters (2003) and covers all government spending and tax categories. Our model recognizes that health care spending peaks near the end of life.<sup>1</sup> Then, to project future expenditures

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and revenues across all spending and tax categories under current law, we had these profiles interact with the projected changes in fertility, population shares, longevity, and other key demographic and economic variables. Our model was calibrated to produce federal receipts and outlays consistent with those of the Office of Management and Budget's (OMB's) long-range projections as reported in the president's budget for fiscal year (FY) 2007.

Our long-range assumptions include an annual labor productivity growth rate (change in hourly labor compensation) of 2.0 percent a year and a consumer price inflation of 2.5 percent a year. Present values were calculated by using a real discount rate of 3.65 percent a year—consistent with the rates on outstanding 30-year U.S. Treasury securities.<sup>2</sup> Although this choice of discount rate might seem a bit high by today's standards, it is consistent with long-run averages; using a smaller discount rate would only increase the calculated size of the imbalance.

Our most important assumption concerns the future growth of health care costs. Those costs are expected to continue increasing relative to GDP because health care is a luxury good. Total health expenditures in the United States grew from about 9.1 percent of GDP in 1980 to about 16.0 percent of GDP by 2004. Under current OMB assumptions, health care costs per capita will grow significantly faster than GDP per capita through 2025.<sup>3</sup> But we assumed that health care costs would then slow

down to only 1.5 percentage points above GDP by 2041 and hold at this level throughout 2080, the last year in the OMB long-term projections. We reduced the growth of health care costs beyond 2080 to ensure that federal health care outlays would eventually stabilize as a share of GDP. Overall, these assumptions are very optimistic by historical standards.

These calculations demonstrate that the U.S. federal government has promised much more than it can deliver with its existing tax base. **Table 1** shows that the federal government currently faces an imbalance equal to \$63.7 trillion. That's the difference in present value between what the government is projected to spend under current law on all expenditure categories—entitlements, defense, roads, and everything else—and what it is projected to receive in taxes across all revenue accounts.

An imbalance of \$63.7 trillion is hard for the average person to fathom. It is larger than the value of the entire capital stock in the United States, including all property, land, buildings, roads, homes, automobiles, factories, bank accounts, stock certificates, and consumer durables. In fact, if the federal government confiscated all the land in the United States along with all of its improvements—buildings, highways, plant and equipment, and other durable assets built on it—and sold them at auction to foreign investors, it would still fall more than \$20 trillion short in present value of the monies

**Table 1. U.S. Federal Fiscal Imbalance and Components, Projected for FY 2006–FY 2012**

Category	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012
<i>Present values (billions of constant 2004 dollars)</i>							
Total fiscal imbalance	63,675	66,118	68,533	70,976	73,501	76,123	78,834
Social Security	7,684	8,017	8,344	8,672	9,011	9,367	9,737
Medicare	65,181	67,578	69,928	72,291	74,728	77,251	79,859
Rest of federal government	-9,190	-9,477	-9,738	-9,987	-10,239	-10,494	-10,762
<i>As a percent of the present value of GDP</i>							
Total fiscal imbalance	6.6	6.6	6.7	6.8	6.9	6.9	7.0
Social Security	0.8	0.8	0.8	0.8	0.8	0.9	0.9
Medicare	6.7	6.8	6.8	6.9	7.0	7.0	7.1
Rest of federal government	-0.9	-0.9	-1.0	-1.0	-1.0	-1.0	-1.0
<i>As a percent of the present value of uncapped payroll</i>							
Total fiscal imbalance	14.4	14.5	14.7	14.8	15.0	15.2	15.4
Social Security	1.7	1.8	1.8	1.8	1.8	1.9	1.9
Medicare	14.7	14.8	15.0	15.1	15.3	15.5	15.6
Rest of federal government	-2.1	-2.1	-2.1	-2.1	-2.1	-2.1	-2.1

Note: Assumptions: annual labor productivity growth rate of 2.0 percent a year, consumer price inflation of 2.5 percent a year, real discount rate of 3.65 percent a year, health care costs per capita rising relatively rapidly through 2025 and slowing gradually thereafter to GDP growth per capita by 2080 (see Note 3 and associated discussion in the text).

required to satisfy its future budget. And this calculation assumes the foreigners would value U.S. property and assets as much as Americans do.

Fortunately, the value of *human capital* in the United States is about three times larger than the value of the nation's physical capital stock. Unfortunately, unless the growth in future outlays is soon substantially curtailed, future generations will be taxed dearly to pay for the nation's entitlement programs.

Table 1 shows that a \$63.7 trillion shortfall is equal to the government immediately confiscating about 6.6 percent of GDP each year—into perpetuity. Of course, the current federal tax base is much smaller than GDP because of depreciation, interest deductions, and numerous other base reductions. So, suppose that the government taxed all wages and salaries, including all payrolls above the Social Security taxable maximum. Table 1 shows that it would have to levy a new 14.4 percent tax on wages and salaries—immediately and forever—on top of existing taxes. The resulting payroll tax would be almost four times as large as the tax that workers now see taken out of their paycheck for Social Security and Medicare and almost twice the combined amount currently paid by workers and their employers.

Moreover, this calculation of the additional tax required to prospectively balance the federal budget assumes, quite optimistically, that employees would continue to work just as hard as before the tax increase, which is contrary to empirical evidence (Feldstein 1995; Prescott 2004). It also assumes that workers would not shift and hide their earnings by migrating to the "informal" sector, as happened in Brazil and other countries with high payroll tax rates.

We conjecture that, realistically, federal tax increases alone can never be successful in eliminating the federal government's budget imbalance. This view is strengthened by the fact that many states are facing budget crises of their own because of rising Medicaid costs—fiscal imbalances that the calculations reported here ignore.<sup>4,5</sup> The extent to which federal taxes could be increased is thus further limited, which suggests that federal spending reductions will have to play an important, if not a major, role in the future.

Adding insult to injury is that the fiscal imbalance increases by \$2.4 trillion each year that current law remains unchanged. Our nation's failure to adjust fiscal policies is like attempting to roll over debt: With accruing interest costs, the debt simply snowballs. In FY 2007, the present value imbalance will stand at \$66.1 trillion after adjusting for inflation. In other words, if the government did its

accounting honestly, it would be reporting a deficit equal to \$2.4 trillion in FY 2006, much larger than the \$296 billion deficit that it currently reports (Mid-Session Review 2006). By 2012, the federal government's fiscal imbalance (or prospective debt under unchanged fiscal policies) will amount to \$78.8 trillion.

Neither this measure of the deficit nor the traditional measure of the deficit, however, accounts for the fact that the U.S. economy—hence, the underlying tax base—is also growing over time. Table 1 shows that the fiscal imbalance is projected to grow by 0.4 percent of the present value of GDP during the next six years if no corrective action is taken or by about 1.0 percent of *uncapped payroll*. To put this cost of delay into context, almost all U.S. workers currently face a Medicare (Hospital Insurance) tax equal to 1.45 percent of uncapped payroll, which appears on their pay stubs. Delaying corrective action for about eight years is equivalent to nearly doubling this tax. Moreover, this calculation assumes, optimistically, that the mounting imbalance has no impact on the economy. If a negative feedback occurs, as consistent with economic theory, the tax base will shrink and the required tax increase will be even larger.

### **"It's Medicare, Stupid"**

So, what accounts for the \$63.7 trillion imbalance as of 2006? Table 1 shows the dimensions of the entitlement crisis that we are facing. The present value shortfalls in the Medicare and Social Security programs alone total \$72.9 trillion, thus accounting for more than 100 percent of the \$63.7 trillion shortfall. Medicare accounts for \$65.2 trillion, and Social Security's imbalance stands at \$7.7 trillion. Medicare's problems are much worse than Social Security's because of the rapid growth expected in health care costs. The "Rest of federal government"—which includes defense, Medicaid, roads, and other programs—is actually in a surplus in present value by about \$9.2 trillion.

But capital market participants should not expect to see substantial Medicare reform anytime soon. The recent Social Security reform debate provides a clue: Although Social Security cash benefits could be easily scaled back over time in a progressive manner, this reform faces constant gridlock in Washington. Medicare reform will require a much larger and more painful debate about which medical treatments and procedures to cover and which to curtail—especially for those requiring costly treatments and those near life's end.

Some observers might argue that we are exaggerating the Medicare problem in our calculations

by ignoring the general revenue transfers received by Medicare Part B (Supplementary Medical Insurance) as well as Medicare Part D (Prescription Drug Coverage). Specifically, about 75 percent of Medicare Part B's outlays are financed out of general revenues, whereas Medicare Part D is entirely financed out of general revenue transfers. We did not count these intragovernmental account transfers as income to the Medicare program in our calculations.

Indeed, in response to a similar assumption in Gokhale and Smetters (2003) presenting fiscal imbalances as of year-end 2002, some commentators argued that we overestimated the burden of the government's overall imbalance resulting from Medicare because Parts B and D were not *intended* by the U.S. Congress to be fully financed from dedicated federal receipts. Auerbach, Gale, and Orszag (2004), for example, considered several alternative methods of presenting Medicare's shortfalls. We would respond, however, that no impact on the overall shortfall of \$63.7 trillion would occur if we recognized the general revenue transfers to Parts B and D when calculating those programs' fiscal imbalances. This recognition would simply shift about \$42 trillion of the imbalance from Medicare to the rest-of-government account. So, this aspect of the debate is not substantive for capital market participants; the debate is more political in nature and really about whether the "blame" for the large prospective shortfalls should be placed on Medicare or the rest-of-government account.

We maintain that the best way of presenting Medicare's shortfalls is to offset its outlays by only its dedicated payroll taxes. The reason—a reason based on principles of budget accounting, not political priorities—is that the reported contribution of any program to the federal government's overall imbalance should reflect the budgetary savings that would be generated by eliminating that program. Of course, we are *not* advocating Medicare's elimination. Rather, we simply favor accounting for any federal spending program's contribution to the federal government's overall imbalance by measuring the total amount of pressure on budgetary resources that the program generates. Otherwise, the purpose of the calculations is unclear. Indeed, practically any federal program could be represented as "free" by simply shifting its costs to the rest-of-government account with a promise of general revenue transfers.

Consistent with our approach, we could separately list defense spending as an imbalance under the rest-of-government account even though it has no dedicated funding source. Doing so would show a defense imbalance equal to about \$32.5 trillion,

which includes significant outlays for the Iraq war. In other words, if we eliminated all military spending (broadly defined) *forever* then we could finance about one-half of Medicare's imbalance.

## Current vs. Future Generations

A crucial distinction exists, however, between defense spending and old-age entitlement programs: Programs such as Social Security and Medicare shift a large amount of resources between generations regardless of whether they are financed with a dedicated payroll tax or out of general revenues. Entitlement programs are financed by transferring funds from young workers to older retirees, which reduces national savings (e.g., Feldstein 1974), increases interest rates, reduces wages, and generates an important debate over generational fairness.

In contrast, defense spending does not produce a financial burden on future generations if the rest-of-government account is in balance. Indeed, if the depreciation rate of defense assets is sufficiently low, such spending might confer a net benefit on future generations. For these reasons, we focus on the nation's two largest old-age programs, Medicare and Social Security.

Table 2 decomposes Social Security's imbalance into net transfers to past and living generations versus future generations. Notice that the past and living cohort (those born 15 years ago and earlier) is projected to contribute more than \$11.0 trillion—that is, more than 100 percent of Social Security's imbalance—to Social Security's \$7.7 trillion present value shortfall as of FY 2006. In other words, past and living generations are projected to consume \$11.0 trillion more in benefits than they will pay in taxes. The reason stems directly from Social Security's so-called pay-as-you-go method of financing. Retirees who were alive when Social Security was first established received benefits despite having paid little in payroll taxes earlier in their working years. The process of subsequently expanding the program's size—by increasing benefits to retirees without funding them from prior taxes on those beneficiaries' earnings—continued for several decades (Geanakoplos, Mitchell, and Zeldes 1998). Most past and living generations, therefore, have taken away much more from Social Security than they contributed—by about \$7.7 trillion in present value.

Whereas past and living generations receive a windfall from Social Security, Table 2 shows that future generations (those born 14 years ago and later) are projected to lose \$3.3 trillion from Social Security under current law. That is, they are

**Table 2. Social Security's Fiscal and Generational Imbalances, Projected for FY 2006–FY 2012**

Category	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012
<b>Present Values (billions of constant 2004 dollars)</b>							
Total fiscal imbalance in Social Security	7,684	8,017	8,344	8,672	9,011	9,367	9,737
Past and living generations	11,019	11,405	11,781	12,157	12,544	12,949	13,372
Future net benefits of living generations	13,039	13,570	14,100	14,639	15,199	15,786	16,389
Trust fund	-2,020	-2,164	-2,319	-2,483	-2,655	-2,837	-3,017
Future generations	-3,335	-3,389	-3,437	-3,485	-3,533	-3,583	-3,635
<b>As a Percent of the Present Value of GDP</b>							
Total fiscal imbalance in Social Security	0.79	0.80	0.81	0.83	0.84	0.85	0.87
Past and living generations	1.14	1.14	1.15	1.16	1.17	1.18	1.19
Future net benefits of living generations	1.34	1.36	1.38	1.40	1.42	1.44	1.46
Trust fund	-0.21	-0.22	-0.23	-0.24	-0.25	-0.26	-0.27
Future generations	-0.34	-0.34	-0.34	-0.33	-0.33	-0.33	-0.32
<b>As a Percent of the Present Value of (Uncapped) Payrolls</b>							
Total fiscal imbalance in Social Security	1.73	1.76	1.78	1.81	1.84	1.87	1.91
Past and living generations	2.49	2.50	2.52	2.54	2.56	2.59	2.62
Future net benefits of living generations	2.94	2.98	3.02	3.06	3.11	3.16	3.21
Trust fund	-0.46	-0.47	-0.50	-0.52	-0.54	-0.57	-0.59
Future generations	-0.75	-0.74	-0.74	-0.73	-0.72	-0.72	-0.71

Notes: "Past and living generations" are those born 15 years ago and earlier. "Future generations" refers to those born 14 years ago and later.

projected to pay \$3.3 trillion more into the system than they will collect in benefits. Adding their "overpayment" to the "underpayment" by previous generations leaves a difference of \$7.7 trillion, Social Security's overall imbalance.<sup>6</sup> In other words, to balance the Social Security system, current generations or future generations must pay an additional \$7.7 trillion in present value and/or receive an equivalent reduction in benefits.

Table 3 shows that Medicare's story is quite a bit different. In particular, past/living generations contribute "only" \$26.5 trillion to Medicare's overall imbalance of \$65.2 trillion, whereas future generations contribute another \$38.7 trillion. Most of the projected shortfall is traced to future generations because health care costs are projected to continue to grow faster than GDP. We project that Medicare spending will grow from 2.7 percent of GDP today to about 12.9 percent of GDP by 2080. These numbers suggest that there will still be plenty of upside potential in spending if the nation continues to value health care as a luxury good and wants more of it relative to income over time.

Although a majority of Medicare's imbalance can be pinned on future generations, remember that past and current generations are still projected to consume \$26.5 trillion more in Medicare benefits than they will pay in Medicare taxes under current

federal fiscal policies. This substantial intergenerational transfer of resources not only raises important issues about generational fairness, it also has a concrete economic impact by reducing national saving. Unless the ongoing excess spending on current generations is reduced or eliminated, their lower saving and capital formation will eventually increase real interest rates and reduce worker productivity and real wages.

Moreover, shortfalls arising from projected "overspending" by future generations cannot be ignored. Structural changes to Medicare will be needed to make sure either that enough money is collected from future generations or that excess benefits are curtailed. As we argued earlier, however, higher taxes are likely to induce future workers to reduce their efforts—by quitting jobs earlier, taking longer vacations, or choosing to work part-time. This scenario is currently being played out in Europe, where tax rates are much higher than in the United States and where average hours worked per year are much lower (Prescott 2004).

Highly 30%

## Who Are the Pessimists?

After the release of our earlier estimates of U.S. fiscal imbalance (Gokhale and Smetters 2003), the Social Security and Medicare trustees adopted long-term budget measures quite similar to our

**Table 3. Medicare's Fiscal and Generational Imbalances, Projected for FY 2006–FY 2012**

Category	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012
<b>Present Values (billions of constant 2004 dollars)</b>							
<i>Total fiscal imbalance in Medicare (Parts A, B, and D)</i>	65,181	67,578	69,928	72,291	74,728	77,251	79,859
Past and living generations	26,496	27,791	29,090	30,417	31,801	33,244	34,747
Future net benefits of living generations	26,828	28,141	29,465	30,816	32,222	33,678	35,213
Trust fund	-332	-349	-376	-400	-421	-435	-466
Future generations	38,685	39,787	40,838	41,874	42,927	44,007	45,111
<i>Fiscal imbalance of Medicare Part A</i>	23,662	24,605	25,535	26,473	27,442	28,449	29,492
Past and living generations	9,432	9,933	10,438	10,956	11,498	12,067	12,662
Future net benefits of living generations	9,735	10,245	10,765	11,301	11,862	12,447	13,068
Trust fund	-303	-311	-327	-345	-364	-381	-406
Future generations	14,229	14,672	15,097	15,517	15,944	16,382	16,830
<i>Fiscal imbalance of Medicare Part B</i>	25,957	26,850	27,723	28,601	29,509	30,450	31,420
Past and living generations	9,751	10,187	10,625	11,074	11,544	12,037	12,547
Future net benefits of living generations	9,780	10,225	10,673	11,128	11,601	12,091	12,607
Trust fund	-29	-38	-49	-55	-57	-54	-60
Future generations	16,206	16,662	17,098	17,527	17,964	18,413	18,873
<i>Fiscal imbalance of Medicare Part D</i>	15,562	16,123	16,670	17,217	17,778	18,352	18,947
Past and living generations	6,411	6,731	7,049	7,371	7,703	8,043	8,398
Future net benefits of living generations	6,411	6,731	7,049	7,371	7,703	8,043	8,398
Trust fund	0	0	0	0	0	0	0
Future generations	9,151	9,392	9,621	9,846	10,075	10,309	10,549
<b>As a Percent of the Present Value of GDP</b>							
<i>Total fiscal imbalance in Medicare (Parts A, B, and D)</i>	6.72	6.77	6.83	6.90	6.97	7.04	7.12
Past and living generations	2.73	2.78	2.84	2.90	2.97	3.03	3.10
Future net benefits of living generations	2.76	2.82	2.88	2.94	3.00	3.07	3.14
Trust fund	-0.03	-0.03	-0.04	-0.04	-0.04	-0.04	-0.04
Future generations	3.99	3.99	3.99	3.99	4.00	4.01	4.02
<i>Fiscal imbalance of Medicare Part A</i>	2.44	2.47	2.49	2.52	2.56	2.59	2.63
Past and living generations	0.97	1.00	1.02	1.04	1.07	1.10	1.13
Future net benefits of living generations	1.00	1.03	1.05	1.08	1.11	1.14	1.17
Trust fund	-0.03	-0.03	-0.03	-0.03	-0.03	-0.03	-0.04
Future generations	1.47	1.47	1.47	1.48	1.49	1.49	1.50
<i>Fiscal imbalance of Medicare Part B</i>	2.67	2.69	2.71	2.73	2.75	2.78	2.80
Past and living generations	1.00	1.02	1.04	1.06	1.08	1.10	1.12
Future net benefits of living generations	1.01	1.02	1.04	1.06	1.08	1.10	1.12
Trust fund	0.00	0.00	0.00	-0.01	-0.01	0.00	-0.01
Future generations	1.67	1.67	1.67	1.67	1.68	1.68	1.68
<i>Fiscal imbalance of Medicare Part D</i>	1.60	1.62	1.63	1.64	1.66	1.67	1.69
Past and living generations	0.75	0.77	0.78	0.80	0.82	0.83	0.85
Future net benefits of living generations	0.75	0.77	0.78	0.80	0.82	0.83	0.85
Trust fund	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Future generations	0.85	0.85	0.84	0.84	0.84	0.84	0.84

(continued)

**Table 3. Medicare's Fiscal and Generational Imbalances, Projected for FY 2006–FY 2012 (continued)**

Category	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012
<b>As a Percent of the Present Value of Uncapped Payrolls</b>							
<i>Total fiscal imbalance in Medicare (Parts A, B, and D)</i>	14.70	14.83	14.96	15.11	15.28	15.45	15.63
Past and living generations	5.98	6.10	6.22	6.36	6.50	6.65	6.80
Future net benefits of living generations	6.05	6.18	6.30	6.44	6.59	6.74	6.89
Trust fund	-0.07	-0.08	-0.08	-0.08	-0.09	-0.09	-0.09
Future generations	8.73	8.73	8.74	8.75	8.78	8.80	8.83
<i>Fiscal imbalance of Medicare Part A</i>	5.34	5.40	5.46	5.53	5.61	5.69	5.77
Past and living generations	2.13	2.18	2.23	2.29	2.35	2.41	2.48
Future net benefits of living generations	2.20	2.25	2.30	2.36	2.43	2.49	2.56
Trust fund	-0.07	-0.07	-0.07	-0.07	-0.07	-0.08	-0.08
Future generations	3.21	3.22	3.23	3.24	3.26	3.28	3.29
<i>Fiscal imbalance of Medicare Part B</i>	5.86	5.89	5.93	5.98	6.03	6.09	6.15
Past and living generations	2.20	2.24	2.27	2.31	2.36	2.41	2.46
Future net benefits of living generations	2.21	2.24	2.28	2.33	2.37	2.42	2.47
Trust fund	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Future generations	3.66	3.66	3.66	3.66	3.67	3.68	3.69
<i>Fiscal imbalance of Medicare Part D</i>	3.51	3.54	3.57	3.60	3.63	3.67	3.71
Past and living generations	1.45	1.48	1.51	1.54	1.57	1.61	1.64
Future net benefits of living generations	1.45	1.48	1.51	1.54	1.57	1.61	1.64
Trust fund	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Future generations	2.06	2.06	2.06	2.06	2.06	2.06	2.06

Notes: "Past and living generations" are those born 15 years ago and earlier. "Future generations" refers to those born 14 years ago and later.

measures. The trustees' calculations are those of the nonpartisan Offices of the Actuary at the Social Security Administration and the Centers for Medicare and Medicaid Services. Whereas our calculations are consistent with the TROIKA [Treasury, CEA (Council of Economic Advisers), and OMB] economic assumptions, the trustees are using slightly more conservative (pessimistic) economic assumptions in making their own projections for Social Security and Medicare. The TROIKA and the trustees use similar demographic assumptions.

**Table 4** compares our calculations with those of the trustees. Sadly, we cannot be accused of scare-mongering. The trustees project a \$13.4 trillion imbalance in Social Security, and we calculate a \$7.7 trillion estimate. They project Medicare's imbalance to be \$70.5 trillion, and we project \$65.2 trillion.

In other words, we are actually the budgetary optimists. To make matters worse, the TROIKA projections used here incorporate "fixes" to the Alternative Minimum Tax only after 10 more years.<sup>7</sup> If it remains unchanged thereafter, the AMT will eventually collect more revenue than the rest

of the federal general revenue tax system. Removing or permanently reforming the AMT would result in much smaller revenues and a considerable increase in the fiscal imbalance.

**Table 5** reports how sensitive fiscal imbalance ratios (as of 2006) are to increases and decreases in our parameter assumptions. It shows that assuming productivity to be 50 bps larger than our baseline actually increases the projected imbalance from 14.4 percent of all future payrolls to 16.3 percent because of larger immediate Medicare costs. Increasing the discount rate by 50 bps—although probably of little or no concern to most readers, given our already high 3.65 percent real rate under the baseline—reduces the imbalance to only 12.9 percent of payroll (again, the numerators and denominators move together). The growth rate in health care costs, however, is an important assumption. If we optimistically assume that the growth rate of health care spending per capita will dip by 50 bps over the next 75 years, then the U.S. fiscal imbalance drops to 8.5 percent of all future payrolls. That is a large decline in shortfalls, but an

**Table 4. Comparison of Our Estimates with Official Estimates for Social Security and Medicare**  
(present values in trillions of constant 2004 dollars)

Plan	Our Estimates	Social Security and Medicare Trustees
<b>Social Security</b>		
Total fiscal imbalance	7.7	13.4
Imbalance from past/living generations	11.0	13.3
<b>Medicare Part A</b>		
Total fiscal imbalance	23.7	28.1
Imbalance from past/living generations	9.4	11.9
<b>Medicare Part B</b>		
Total fiscal imbalance	26.0	26.2
Imbalance from past/living generations	9.7	10.5
<b>Medicare Part D</b>		
Total fiscal imbalance	15.6	16.2
Imbalance from past/living generations	6.4	6.3

additional tax equal to 8.5 percent of all future payrolls still constitutes a sizable problem. More realistically, if we assume that health care cost growth will be 50 bps faster than our baseline assumption—which is much more consistent with historical averages—then the imbalance balloons to 22.5 percent of projected payrolls.

### Why Are Capital Markets Not Reacting?

Capital market participants appear to be concerned about explicit budget deficits that reflect past over-spending. They do not seem to care about projected future shortfalls. Are they simply myopic? Or is something else going on?

**Table 5. Sensitivity of U.S. Federal Government Fiscal Imbalances as of FY 2006 to Economic Assumptions**

	Baseline Assumptions	Discount Rate <sup>a</sup>		Productivity Growth <sup>b</sup>		Excess Health Care Outlay Growth per Capita <sup>c</sup>	
		High	Low	High	Low	High	Low
<i>Present values (billions of constant 2004 dollars)</i>							
Total fiscal imbalance	63,675	48,918	86,345	91,011	44,322	99,544	37,694
Social Security	7,684	5,247	11,445	7,312	7,694	7,684	7,684
Medicare	65,181	51,137	86,184	88,476	48,386	92,886	45,170
Rest of federal government	-9,190	-7,465	-11,283	-4,777	-11,758	-1,026	-15,160
<i>As a percent of the present value of all future GDP</i>							
Total fiscal imbalance	6.6	6.1	7.7	7.4	5.7	10.3	3.9
Social Security	0.8	0.7	1.0	0.6	1.0	0.8	0.8
Medicare	6.7	6.4	7.7	7.2	6.2	9.6	4.7
Rest of federal government	-0.9	-0.9	-1.0	-0.4	-1.5	-0.1	-1.6
<i>As a percent of the present value of all future payroll</i>							
Total fiscal imbalance	14.4	12.9	16.3	16.3	12.4	22.5	8.5
Social Security	1.7	1.4	2.2	1.3	2.1	1.7	1.7
Medicare	14.7	13.5	16.2	15.9	13.5	21.0	10.2
Rest of federal government	-2.1	-2.0	-2.1	-0.9	-3.3	-0.2	-3.4

<sup>a</sup>High and low discount rate assumptions add and subtract, respectively, 50 bps from the baseline value of 3.65 percent a year.

<sup>b</sup>High and low productivity growth assumptions add and subtract, respectively, 50 bps from the baseline value of 2.0 percent a year.

<sup>c</sup>High and low excess health care outlay growth per capita add and subtract, respectively, 50 bps from the baseline growth rate trajectory. See Note 3 and related text for details.



The issue is particularly important because a significant negative signal by the capital markets—such as driving up the government's interest costs—could force Congress to exercise fiscal discipline. In this section, we consider some reasons capital markets might seem unconcerned by the federal government's long-term financial shortfalls.

☛ Hypothesis 1 Explicit government debt is real, whereas unfunded liabilities are not. The argument is sometimes made that explicit government "paper" debt is "real debt" whereas unfunded liabilities are not. In particular, paper debt must be paid off, whereas unfunded liabilities are subject to future changes in laws and could be altered.

The problem with this argument is that it actually is not clear which form of obligation, explicit or implicit, is "harder" to repudiate. The only real difference between promised entitlement obligations and explicit debt is the set of policy options available for dealing with each of them.

\* The federal government can reduce explicit debt by monetizing it (except for inflation-protected securities, which make up only 10 percent of outstanding debt held by the public), increasing taxes, or declaring bankruptcy. In contrast, the federal government can reduce its Social Security and Medicare obligations only very little by bringing about higher inflation because these obligations are almost perfectly protected against inflation.<sup>8</sup> Although the government could technically remove this protection, doing so would be politically extremely difficult, if not impossible. The only realistic choices for reducing the size of future unfunded obligations are (1) to directly cut scheduled benefits initially received at retirement and (2) to subject beneficiaries to higher income taxes.

So, the question is: Would it be less difficult for the government to monetize explicit debt by printing more money or for the government to directly constrain growth in such entitlements as Social Security and Medicare? The answer is, of course, a subjective political conjecture. But we believe that when, in light of mounting cash flow deficits, policymakers are eventually forced to make a choice, an "inflation tax" will be the path of less resistance than directly legislating cuts in entitlement benefits or increasing taxes. Why? Because higher inflation can be achieved at "arm's length" by technocrats at the Federal Reserve Board. Moreover, the Fed might justify the higher nominal rates produced by inflation as an attempt to keep real rates low and bolster economic activity in the face of mounting fiscal deficits. However, that strategy would work only temporarily, at best.

## PREDICTION

We envision the following sequence of events.\* Budget deficits continue to climb as the prescription drug bill and other Medicare programs continue to zap the budget. An extension of the tax cuts, elimination of the AMT, and lack of entitlement reforms add even greater momentum to debt growth. As our debt-to-GDP ratio climbs higher, investor confidence in the federal government's ability to repay that debt in full—that is, to maintain its real value by sticking to a monetary policy of price stability—erodes. And capital flight from U.S. shores places even more upward pressure on interest rates.

But here is the puzzle: In a rational world, capital markets should have figured this out already and started to push up long rates today. It has not happened. We have not seen even the tiniest of blips in capital inflows or interest rates despite the failure to reform Social Security and passage of a Medicare prescription drug bill that added trillions of dollars in additional unfunded federal obligations. The current term structure is unlikely to be "too short" to capture the effects of such large changes in the outlook for debt growth. If, for example, the federal government started auctioning off consol bonds, the implied rates would apparently not be much higher than 30-year Treasuries.<sup>9</sup> Something else must be going on.

☛ Hypothesis 2 Stein's Law. This law says, "That which cannot go on forever won't." It is an oft-quoted truism inside the DC Beltway that was intended to keep policymakers from proposing unsustainable policies. In practice, however, Stein's Law has rationalized all sorts of fiscal recklessness because it lacks any teeth. Policymakers today can afford to be generous because they know that future policymakers will be forced to figure out how to pay the bill. Want to take credit for sending a man to Mars? Announce the goal today and let future policymakers work out how to pay for it. (President John F. Kennedy set a 10-year goal in 1961 of sending people to the moon.) Want to pass a prescription drug bill to help win reelection? Just set up the train and rails today and give the train a little push. Then, let future policymakers figure out how to deal with the financial abyss a few miles down the line. Do not worry; they'll figure it out. It's Stein's Law.

Capital markets, of course, do not need to care about these sorts of shenanigans. All they need to know is that future policymakers will eventually figure it out. To be sure, future policymakers will have to figure out how to not simply reduce but eliminate the \$63.7 trillion imbalance. Budget constraints are inescapable. Policymakers cannot spend a nickel more than they will collect in taxes in present value.

But capital markets should care about *how* future policymakers will “figure it out.” As we suggested, we believe that future Congresses and future occupants of the White House won’t muster enough willpower to eliminate the entire \$63.7 trillion imbalance by directly controlling the growth rate in entitlement spending. That leaves tax increases and higher inflation (via debt monetization) as the only other alternatives. In fact, because the median voter in the United States continues to grow older, tax increases and inflation will probably share more than 100 percent of the load because, in our opinion, entitlement benefits will probably continue to grow. But capital market participants should view both of these options quite negatively. The high likelihood of future tax increases and higher inflation should increase interest rates today.

■ Hypothesis 3. The future is too uncertain to be predictable. Another common criticism of the fiscal imbalance estimates that we and other economists (including the Social Security and Medicare trustees) calculate is that they are subject to considerable uncertainty. The world could look very different after another 30 years or so compared with the world we project under the economic and demographic assumptions built into our fiscal imbalance estimates. Maybe productivity will double or longevity improvement will reach a limit sooner than we anticipate, or maybe medical breakthroughs will make health care much cheaper rather than costlier. Or maybe people will delay retirement and pay more taxes than in the past, thereby reversing decades of movement toward earlier retirement. Given this great uncertainty, capital market participants may have decided that it is best to “wait and see” what the future holds. In other words, the cumulative information available to date about a dire fiscal outlook is not yet sufficient to justify a major revision of existing investment portfolios.

Of course, this position ignores the fact that our projections are, if anything, actually optimistic. Remember, although our projections appear scary to us, these fiscal imbalance estimates are on the low side! Using a smaller discount rate or assuming a more realistic growth rate in health care costs would make the outlook even bleaker.

Finally, regardless of these “technicalities,” this uncertainty hypothesis is simply irrational. The correct response to uncertainty is not to ignore it. Indeed, an increase in nondiversifiable uncertainty should cause households, as well as the federal government, to *increase* their precautionary saving, not reduce it. In other words, we should implement policies that, if anything, provide a little cushion in case projections turn out to be worse than we thought.

■ Hypothesis 4. Foreigners will bail us out. As the U.S. population ages, a larger number of retirees will attempt to sell their assets to a smaller base of workers to finance their postretirement consumption. Stock prices may, therefore, decrease (Poterba 2004). Foreigners, however, could help reduce the blow on stock prices by expanding the base of available buyers. Siegel (2005) argued that foreigners—in particular, the Chinese—can stabilize the U.S. capital markets as Baby Boomers make their way into retirement. But his analysis did not include a fiscal sector, so it avoided the problem of fiscal shortfalls that we are considering here. Many of the U.S. government’s current creditors, including China and Europe, face fiscal burdens from their own aging populations. Rather than relieving us, the financial problems facing our international competitors make ours worse by reducing the supply of debt financing.

Foreigners care about inflation prospects as much as U.S. investors. To the extent that Congress and the president effectively cede a substantial portion of fiscal policy to the Fed—as we suspect they will in the future—foreigners have little reason to continue to help us maintain low nominal interest rates. Inflation is caused by printing more money, but its root cause is fiscal, not monetary. Once U.S. investors figure out the implications of U.S. federal fiscal policy, foreigners cannot be far behind—and they may even lead in redirecting their savings to other shores.

Of course, a lot will depend on our ability to “catch up” with the missed opportunities for implementing fiscal reforms. The Baby Boomers are still entirely in the workforce, and this generation could still help fund its own retirement needs. Incentives to do so are dampened, however, by current fiscal policies that promise retirement benefits in excess of our capacity to pay them. Reforming these policies immediately would provide the appropriate incentives to avoid the potential for collapse of our nation’s financial system.

## Conclusion

Conversations with fixed-income investors reveal an enormous myopia about the implications of the financial problems facing the federal government. Even worse, these informal discussions reveal a high degree of herding, reinforced by the view that capital markets are always efficient: Because capital market participants exhibit close to zero concern about the long-term financial problems facing the government, those problems must not really be important. The general belief that capital markets cannot be wrong is exactly why they can, however, and why an Argentina-type disaster can happen in

the United States. The financial shortfalls that the federal government faces are unprecedented, as investors will eventually figure out. Hopefully, policymakers will have the wits and political will to address these shortfalls soon and avoid a situation in which investors suddenly realize the shortfalls' implications and attempt to exit the fixed-income market all at once.

The opinions and conclusions expressed in this article are solely those of the authors and do not necessarily represent the opinions of the Cato Institute or the Wharton School.

This article qualifies for 1 PD credit.

## Notes

1. We thus calibrated the age/gender profiles to shift over time with rising longevity. The projections of longevity improvements were based on extrapolations of exponential regressions on historical declines in death rates by cause of death. Mortality declines were calibrated to reductions in death rates averaged across various causes of death. We also distinguished between spending on health care by age and gender separately for those who were one, three, and more than three years away from the end of their lives.
2. For technical details of our micro data-based projections and other details, readers are referred to Gokhale and Smetters (2003). Although the OMB's projected long-term interest rates in the FY 2005 budget are slightly higher, we used a 3.65 percent annual rate to make present value estimates comparable with those published in this 2003 study.
3. In the years 2009–2016, Medicare Parts A and B are both assumed to grow by 1 percentage point faster than GDP per capita. During the same years, Medicare Part D is assumed to grow by 5 percentage points faster than GDP per capita. Between 2017 and 2020, Part A is assumed to grow faster than GDP by 2.8 percentage points a year; Part B, by 4.2 percentage points; and Part D, by 5.5 percentage points.
4. See, for example, Baker, Besendorfer, and Kotlikoff (2002). And the fiscal problems that they measured have probably worsened dramatically since their study because economic growth forecasts have been reduced and Medicaid cost forecasts have risen. Also, see Edwards and Gokhale (2006).
5. Our calculations include only the federal share of Medicaid costs (under "Rest of federal government," as in Table 1).
6. Quote marks are used for "overpayment" and "underpayment" because a society might believe that richer future generations should transfer resources to previous generations. We do not wade into this debate in this article.
7. The TROIKA budget projections assume no AMT creep after the next 10 years.
8. Social Security contains a couple of minor features that are not perfectly indexed to inflation, but these features tend to be quantitatively unimportant. It might be possible to inflate away the real value of any nonindexed debt incurred to transfer funds to the Social Security and Medicare trust funds to pay inflation-indexed benefits. But doing so would involve sustained inflation and explosive debt creation over time as those benefits became due and payable.
9. A consol is a government bond with no maturity. The price of a consol is the consol payment divided by its yield to maturity.

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# Causes and Seasonality of Momentum Profits

Richard Sias

*With Januaries (a month in which lagged “losers” typically outperform lagged “winners”) excluded, the average monthly return to a momentum strategy for U.S. stocks was found to be 59 bps for non-quarter-ending months but 310 bps for quarter-ending months. The pattern was stronger for stocks with high levels of institutional trading and was particularly strong in December. The results suggest that window dressing by institutional investors and tax-loss selling contribute to stock return momentum. Investors using a momentum strategy should focus on quarter-ending months and securities with high levels of institutional trading.*

**S**tocks exhibit return momentum: Lagged “winners” (i.e., securities in the top performance decile based on returns over the previous six months) subsequently outperform lagged “losers” (i.e., securities in the bottom lagged six-month performance decile).<sup>1</sup> Both tax-loss selling in December and window dressing by institutional investors in quarter-ending months may contribute to stock return momentum. In the case of tax-loss selling, investors (individual investors and some institutional investors) may favor selling losers in December to realize taxable losses.<sup>2</sup> In addition, investors may avoid selling winners in December to forestall recognizing taxable gains. As a result, tax-motivated selling of losers and resistance to selling winners may contribute to return momentum in December. Empirical work suggests that at least some investors use such tax-based timing strategies and that such trading has price effects (e.g., Sias and Starks 1997; Poterba and Weisbenner 2001; Ivkovic, Poterba, and Weisbenner 2005).<sup>3</sup> Moreover, Grinblatt and Moskowitz (2004) argued that momentum profits are higher in December than the average for other months because of, at least in part, investors’ tax-loss selling.

Window dressing on the part of institutional investors may also contribute to the seasonality of momentum profits. At quarter-end and, especially, year-end, institutional investors may want to abandon lagged losers to avoid reporting “embarrassing” stocks in their end-of-quarter or end-of-year holdings. Similarly, managers may buy lagged winners to appear as if they held respectable or

“winning” stocks throughout the period (an example is buying Google in 2005). Empirical evidence suggests that some professional investors engage in such strategies (e.g., Sias and Starks 1997; Musto 1999; He, Ng, and Wang 2004; Meier and Schaumburg 2004). Thus, institutional investors buying lagged winners and selling lagged losers prior to quarterly reporting dates may contribute to return momentum in quarter-ending months.

If institutional window dressing and tax-loss selling contribute to return momentum, then (1) return momentum will be observable as becoming more seasonal over time because institutional investors’ impact on the market has grown over time, (2) profits from momentum strategies will tend to be greater in quarter-ending months, and (3) return-momentum seasonality will be greater for stocks with higher levels of institutional trading. My empirical tests support all three propositions.

## Tests and Results

Following previous work (e.g., Jegadeesh and Titman 2001), I focused on a six-month formation period followed by a six-month holding period. The profitability of a momentum strategy was defined as the return on a portfolio that was long the top decile of securities and short the bottom decile of securities in past-six-month performance.

In defining winners and losers, I excluded the return from the last five trading days of the formation period to minimize microstructure-induced errors, such as bid–ask bounce (see Jegadeesh and Titman 1993). I used daily return data from CRSP and limited the analysis to ordinary shares (i.e., American Depositary Receipts and closed-end funds were excluded).

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