Is the Fed Facilitating an Unpleasant Fiscal Arithmetic?

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Is the United States headed for an unprecedented economic disaster? The fact that prominent economists are posing that question says something about what they may be expecting. For example, in the St. Louis Fed's *Review*, Kotlikoff (2006) argues that the United States is headed for bankruptcy. Federal expenditure commitments on account of massive government entitlement programs are growing larger and becoming less reversible. The traditional perspective on how significant inconsistencies between outstanding government liabilities and the government's future expected budget balances are resolved suggests that higher inflation could be the mechanism by which those two items are realigned with each other.

There is ongoing debate about whether faster inflation would occur because the Federal Reserve would eventually be forced to support the government's future debt-financed expenditures through monetary accommodation or whether a sudden realignment of prices could occur even without an independent or fiscally induced monetary expansion—following the predictions of the so-called fiscal theory of the price level (FTPL).

This article first outlines the scope of the prospective U.S. federal budget crunch by reporting the federal "fiscal imbalance" and its components. The fiscal imbalance measure compares, in present value terms, outstanding debt plus the government's aggregate noninterest spending commitments with its future revenues under current policies. Latest available calculations suggest that the federal fiscal imbalance equals $63.7 trillion. The Social Security program contributes $7.7 trillion to that amount. Assuming that annual general

revenue transfers to Medicare are not dedicated to it, Medicare contributes $65.2 trillion, and the rest of the federal government, which includes Medicaid, contributes –$9.2 trillion.[1]

An overall fiscal imbalance of $63.7 trillion suggests that *expected* future primary budget surpluses—government receipts minus non-interest expenditures—may (or should) be considerably out of line with the real value of outstanding government debt. Although the FTPL would predict an immediate price level adjustment, such an adjustment has not yet been observed.[2] And, although economists have attempted to garner evidence in support of the FTPL by analyzing evidence from other countries (most notably Loyo 1999), there is as yet a lack of broad consensus about the empirical validity of the FTPL. Because the FTPL essentially bypasses all concerns about the conduct of monetary policy, this article says little about the FTPL beyond noting it as a theoretically valid possibility. It devotes more attention to the traditional monetary-policy-supported inflationary mechanism as analyzed by Sargent and Wallace (1981).

Sargent and Wallace's "unpleasant monetarist arithmetic" provides the theoretical framework for analyzing how U.S. fiscal and monetary policymakers could be interacting. Although their framework is based on special assumptions about how fiscal and monetary policies are made, it reveals the tradeoffs involved depending on which of those two policymaking authorities acts as the "leader" and which acts as the "follower." Most common is to assume that the fiscal authority leads. But when it sets a permanent path for taxes and spending involving excessive debt creation, the monetary authority must coordinate its policies to accommodate that path by monetizing government debt.

On the basis of more realistic assumptions about fiscal and monetary authorities' policymaking horizons, however, this article suggests that current world market forces and the actions of both a "not-so-independent" Federal Reserve and shortsighted fiscal policymakers are worsening an already severe federal budget crunch by maintaining a severely out-of-balance fiscal policy. Continuing such a fiscal stance over many years implies redistributing resources from

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[1]If general revenue transfers were considered to be dedicated to Medicare, that program's fiscal imbalance would be reduced, but that of the rest of the government would be increased by an identical amount, leaving the total fiscal imbalance estimate unchanged.

[2]The FTPL would also predict a similar price level adjustment whenever changes to fiscal policies widen the gap between real debt outstanding and expected future primary surpluses. Major legislation such as the Medicare prescription drug law enacted in 2003 is an obvious candidate for consideration in this context. However, no significant price level realignment attributable to the passage of the prescription drug law was observed around that time.

younger and future generations toward older ones.[3] That means future generations must pay by accepting either steep benefit cuts or permanently higher taxes, the latter possibly involving more rapid inflation.

Plumbing the Depths of the U.S. Fiscal Hole

The seeds of the looming economic difficulties were sown many decades ago by a combination of social insurance policies and a protracted boom-bust sequence in fertility rates that was completed by the mid-1960s. The consequence of that temporary fertility surge—a 76-million-strong baby-boom generation—is now approaching retirement with expectations of substantial Social Security, Medicare, and other entitlement transfers—roughly consistent with current benefit rules.[4] Fulfilling those expectations for a cohort equaling one-quarter of the total U.S. population would require steep increases in future taxes—not least because U.S. labor force and federal revenue growth are projected to slow just as the boomers begin retiring en masse toward the end of the current decade. One way of raising those larger revenues may be via faster inflation.

Table 1 shows an estimate of the U.S. fiscal imbalance with budget projections extended without a time limit. It shows that the United States faces a federal budget shortfall equivalent to $63.7 trillion as of 2006 calculated under the Office of Management and Budget's baseline economic and demographic assumptions (Gokhale and Smetters 2007). That means continuing current policies under those assumptions involves government debt plus the excess of projected outlays over receipts totaling $63.7 trillion in present discounted value.[5] Social Security contributes $7.7 trillion and the Medicare program contributes $65.2 trillion to the total federal imbalance. The rest of the

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[3]The first major treatise on the measurement of U.S. intergenerational redistribution through fiscal policies was completed more than 15 years ago. See Auerbach, Gokhale, and Kotlikoff (1991).

[4]Most studies on individual expectations of future Social Security benefits suggest that younger people are more skeptical than older ones of receiving benefits. However, conditioned on the continued existence of the Social Security system, most people expect to receive benefits consistent with current levels. See Dominitz, Manski, and Heinz (2001).

[5]Debt worth $63.7 trillion would not actually accumulate because the government would be forced to change fiscal and monetary policies at some point in the future in order to pay off accumulating debt. Fiscal-imbalance-type measures are useful, however, to show the magnitude of the mismatch between outstanding debt and future budget balances under current policies.

TABLE 1
U.S. FEDERAL FISCAL IMBALANCE AND ITS COMPONENTS

Panel A.   Present Values in Billions of Constant 2006 Dollars

	FY2006	FY2007
Total Fiscal Imbalance—		
U.S. Federal Government	63,675	66,118
Social Security	7,684	8,017
Medicare	65,181	67,578
Rest of Federal Government	–9,190	–9,477

Panel B.   As a Percent of the Present Value of GDP

Total Fiscal Imbalance—		
U.S. Federal Government	6.6	6.6
Social Security	0.8	0.8
Medicare	6.7	6.8
Rest of Federal Government	–0.9	–0.9

Panel C.   As a Percent of the Present Value of (Uncapped) Payrolls

Total Fiscal Imbalance—		
U.S. Federal Government	14.4	14.5
Social Security	1.7	1.8
Medicare	14.7	14.8
Rest of Federal Government	–2.1	–2.1

NOTE: Discount rate = 3.65 percent, consistent with rates on 30-year Treasuries outstanding; Terminal labor productivity growth rate = 1.8 percent, consistent with the economic assumptions of the Office of Management and Budget under the Budget for the United States Government, Fiscal Year 2007; AMT fix applied for the next 10 years only. Allowance made for higher revenues from bracket creep throughout the projections. Figures as a percent of the present value of payrolls use the Medicare wage tax base.
SOURCE: Authors' calculations.

federal government's contribution to the fiscal imbalance (which includes Medicaid) equals –$9.2 trillion.[6]

These fiscal imbalance figures have a simple interpretation: For example, Social Security's imbalance of $7.7 trillion shows the amount

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[6]This assumes that general revenues used to finance a part of the Supplementary Medical Insurance program and the entire Medicare Part D (prescription drug) program represent resources that are "appropriated" rather than "dedicated" to those programs. Under the latter assumption, Medicare's fiscal imbalance would equal $24 trillion rather than $65 trillion. However, under that assumption, the imbalance on account of the rest of the federal government would be $32 trillion rather than –$9 trillion.

of *additional* resources that the government must have on hand, invested at interest, in order to forever avoid changing Social Security's current payroll tax and benefit policies. The same interpretation applies to Medicare's fiscal imbalance estimate.[7] Because the rest of the federal government account shows a negative fiscal imbalance, that federal sector could reduce taxes or increases outlays by as much as $9.2 trillion in present value. Of course, overall, the federal government is short by $63.7 trillion and must raise those resources by enacting future policy changes—reductions in scheduled expenditures or increases in scheduled taxes or some combination of the two. Tax increases are unlikely to be effective because of their likely negative economic impact. Nevertheless, if the Congress does not explicitly adopt either one of these two fiscal approaches in the not-too-distant future, faster inflation could emerge as a default adjustment mechanism.

Table 1 also shows that the fiscal imbalance will grow larger over time as long as no corrective policy adjustments are undertaken. For example, the imbalance as of 2007 amounts to $66.1 trillion since no policy changes were enacted in 2006 to reduce its size. The accrual of an additional $2.4 trillion to the fiscal imbalance arises because the dates when revenue shortfalls are projected to occur move nearer to the present with the passage of time. An alternative way to state this outcome is that the fiscal imbalance as of 2006 accrues interest. The current annual cost of postponing fiscal adjustments ($2.4 trillion) is about 10 times larger than the officially reported annual deficit for fiscal year 2006 (U.S. Treasury 2006).

If the fiscal imbalance under current policies is resolved largely by tax-side adjustments, how high must taxes be increased? Panel C of Table 1 shows that taxes on total payrolls would have to be increased immediately and permanently by 14.4 percentage points—a more than doubling of the existing payroll tax of 15.3 percent, most of which is levied on capped payrolls.[8]

Alternatively, if the fiscal imbalance were resolved largely through entitlement benefit cuts, those benefits (Social Security plus Medicare) would have to be reduced by 47.4 percent immediately and permanently. Yet another alternative would be to permanently cut

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[7]This assumes that the general revenue transfers to Medicare are "appropriated" for that program rather than "dedicated" to it. See Gokhale and Smetters (2006) for a fuller discussion of this issue.

[8]The Social Security employer plus employee payroll tax of 12.4 percent is levied on capped payrolls. The 2.9 percent employer plus employee Medicare payroll tax is not subject to a similar ceiling on taxable employee compensation.

all outlays except those on Social Security and Medicare by 65.5 percent.

Table 2 shows Social Security's fiscal imbalance and its components: Past and living generations account for more than 100 percent of the program's total fiscal imbalance ($11.0 trillion of $7.7 trillion). That means that past and current generations stand to reap an additional 11.0 trillion in Social Security benefits over and above their payroll tax payments into the system (the sum of their accumulated past benefits net of past tax payments plus their discounted future benefits and minus their discounted future taxes). Future generations, on the other hand, would pay $3.3 trillion in net taxes into the system under current Social Security tax and benefit policies, including future changes to those policies that are already scheduled.

Table 2 shows that the ratio of Social Security's fiscal imbalance to the present value of GDP is 0.79 percent as of 2006. In 2007, that ratio will be slightly higher since no policy adjustments were made during 2006. Table 3 shows similar information for the Medicare program, indicating that its fiscal imbalance is about six times larger than Social Security's fiscal imbalance. Past and living generations are projected to receive Medicare benefits in excess of their payroll taxes to the tune of $26.5 trillion. Thus, for Social Security and Medicare combined, current and past generations are being awarded about $37.5 trillion in excess benefits as a result of those programs' policies to date.

So far, the two major political parties appear to be stuck in a logjam, refusing to compromise on their preferred approaches to resolving future budget shortfalls. I discuss the forces sustaining the current budget policy logjam and why a resolution-forcing mechanism may involve faster inflation in the following section. I also suggest that the Federal Reserve's current commitment to price stability may also be helping to postpone a resolution, thereby worsening the looming federal budget crunch.

What Sustains the Current Budget Policy Logjam?

The current economic environment clearly provides no absolute imperative for policymakers to adopt corrective fiscal adjustments immediately. Indeed, lawmakers recently worsened the federal budget outlook by enacting the Medicare Prescription Drug program (Medicare Part D) in 2003 when the fiscal imbalance was already

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TABLE 2
SOCIAL SECURITY'S FISCAL AND GENERATIONAL IMBALANCES

Panel A.   Present Values in Billions of Constant 2004 Dollars

	FY2006	FY2007
Total Fiscal Imbalance in Social Security	7,684	8,017
Past and Living Generations (GI)	11,019	11,405
Future Net Benefits of Living Generations[a]	13,039	13,570
Trust Fund	−2,020	−2,164
Future Generations[b]	−3,335	−3,389

Panel B.   As a Percent of the Present Value of GDP

Total Fiscal Imbalance in Social Security	0.79	0.80
Past and Living Generations (GI)	1.14	1.14
Future Net Benefits of Living Generations[a]	1.34	1.36
Trust Fund	−0.21	−0.22
Future Generations[b]	−0.34	−0.34

Panel C.   As a Percent of the Present Value of (Uncapped) Payrolls

Total Fiscal Imbalance in Social Security	1.73	1.76
Past and Living Generations (GI)	2.49	2.50
Future Net Benefits of Living Generations[a]	2.94	2.98
Trust Fund	−0.46	−0.47
Future Generations[b]	−0.75	−0.74

[a]Those born 15 years ago and earlier. In the year 2004, for example, this category includes people born before 1990.
[b]Those born 14 years ago and later. In the year 2004, for example, this category includes people born during 1990 and later.
SOURCE: Authors' calculations.

quite large and positive,[9] and Congress may decide to enact yet more programs or expand existing ones during the next few years to increase rather than reduce the overall federal fiscal imbalance.

Today's budget policy logjam appears to be the result of two

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[9]Estimates from 2003 excluding the Bush administration's proposed Medicare Part D outlays would have shown a U.S. fiscal imbalance of $38.1 trillion.

TABLE 3

MEDICARE'S FISCAL AND GENERATIONAL IMBALANCES

Panel A.   Present Values in Billions of Constant 2004 Dollars

	FY2006	FY2007
Total Fiscal Imbalance in Medicare	65,181	67,578
Past and Living Generations (GI)	26,496	27,791
Future Net Benefits of		
Living Generations[a]	26,828	28,141
Trust Fund	–332	–349
Future Generations[b]	38,685	39,787

Panel B.   As a Percent of the Present Value of GDP

Total Fiscal Imbalance in Medicare	6.72	6.77
Past and Living Generations (GI)	2.73	2.78
Future Net Benefits of		
Living Generations[a]	2.76	2.82
Trust Fund	–0.03	–0.03
Future Generations[b]	3.99	3.99

Panel C.   As a Percent of the Present Value of (Uncapped) Payrolls

Total Fiscal Imbalance in Medicare	14.70	14.83
Past and Living Generations (GI)	5.98	6.10
Future Net Benefits of		
Living Generations[a]	6.05	6.18
Trust Fund	–0.07	–0.08
Future Generations[b]	8.73	8.73

[a]Those born 15 years ago and earlier. In the year 2004, for example, this category includes people born before 1990.
[b]Those born 14 years ago and later. In the year 2004, for example, this category includes people born during 1990 and later.
SOURCE: Authors' calculations.

interacting forces, and the lack of pressure to compromise is supported by three features of the current economic environment. The first factor producing the logjam is electoral pressure for politicians to deliver ever-larger "benefits" to voter blocs while distributing the costs as broadly as possible, which includes passing them forward to future generations.

The second factor is conflict among current voters about *intra*generational redistribution—essentially about how entitlement and other benefits should be financed at the margin—via tax increases or expenditure cuts. Within a political system dominated by two major

political parties, voters' support for reducing the logjam depends on whether their *current* net gains are larger on the spending or the tax side of the budget ledger. Larger government spending implies higher taxes, but the two need not be perfectly aligned in time. Those who are helped more by government expenditures and hurt less by tax increases—call them Group A—prefer expansions in the government's role in allocating resources. Those who benefit little from government spending but could lose significantly from tax increases—Group B—favor a smaller role for government in allocating resources. Group B prefers tax cuts in the hope of (eventually) reducing government-controlled resource allocations. This is the well-known "starve the beast" hypothesis.

One could contemplate reducing the outstanding federal fiscal imbalance by associating each generation's current payroll taxes with its future entitlement benefits. Cuts in the latter would then justify cuts in the former. And if cuts in current taxes were smaller compared to cuts in future benefits on a present value basis, the government's financial position would improve. However, this policy is problematic for Group A members, who fear that a program of cutting future benefits would be expanded into cutting current ones as well because lower current revenues would increase current federal deficits. And they fear that cuts in current benefits would trigger additional tax cuts and weaken a policy that they favor—government-directed resource allocation. A resolution of the fiscal imbalance through higher current taxes, however, is opposed by Group B members, who fear an expansion of current *intra*generational redistribution under the guise of saving the tax increase for meeting unfunded future benefit commitments. Both sides believe that to compromise is to surrender and fear the electoral losses that could follow.[10]

The longer the fiscal imbalance remains unresolved, however, the larger the cost of resolving it—whether through direct fiscal policy changes or via faster Fed-induced inflation in response to worsening economic conditions. The political logjam between the two groups could be described as the outcome of a "prisoners' dilemma" game (Gokhale 2006).

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[10]Demand-side economic management and stabilization through fiscal policy generally require more information generation and processing than is feasible for timely policy implementation by Congress and the administration. Adherents to establishing a stable and credible low-tax environment and allowing private entrepreneurship, innovation, and free trade to direct economic resources to their best uses following market-generated price signals seem to have grown in number in recent years—especially after Reagan-era tax cuts ushered in two-plus decades of robust economic growth, interrupted only by two mild economic recessions.

Three elements of the current economic environment appear to support postponing policy adjustments to resolve the outstanding fiscal imbalance. First, as experience from the 1980s and 1990s suggests, the "prisoners' dilemma" game between the two political opponents can continue as long as the deficit outlook can be made to appear benign or favorable.[11] Current "baseline" budget projections by the Congressional Budget Office, which suggest very low debt accumulations through the next decade, achieve just that. Second, experience from the 1970s suggests that stable prices are an important element for ensuring a benign economic outlook. The Federal Reserve's strong commitment to and high credibility among fiscal policymakers for delivering current price stability are an important element for establishing a benign economic outlook. Finally, high saving in foreign saving and their preference for "investing" in the United States reduces world interest rates and keeps the dollar overvalued on currency markets despite massive U.S. trade deficits, again allowing postponement of fiscal adjustments. The following subsections examine the dimensions of each of those factors in greater detail.

The Budget Outlook: Baseline versus Alternative

Partly as a result of recent higher-than-average economic growth, federal revenues have grown robustly and have reduced deficit projections over the next few years. According to the Congressional Budget Office's 2006 projections, the federal budget deficit is expected to shrink from 1.9 percent of GDP ($248 billion/$13,308 billion) to just 0.4 percent of GDP ($93 billion /$21,052 billion) by 2016 (CBO 2006).[12]

However, the "current law" baseline on which those projections are based includes several elements that may not be realized. It assumes that war outlays will remain fixed in dollar terms rather than grow over time; that the AMT will remain unreformed; and that recent tax cuts won't be extended beyond their "sunset" dates. Although the Congressional Budget Office is constrained to adopt a strict "current

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[11]Recall experience from the early and mid 1990s, when an outside presidential candidate (Ross Perot) successfully played on the dangers of higher projected deficits to get many voters to defect from the two major parties.

[12]The CBO's long-range projections (CBO 2005), however, assuming intermediate spending levels and higher revenues (from continuation of current AMT law and bracket creep) show federal spending rising to 38 percent of GDP and federal debt held by the public increasing to 100 percent of GDP by 2050. Under lower assumed revenues (where laws are periodically changed to hold revenues at their historical average of 18.3 percent of GDP), the ratio of debt held by the public to GDP explodes to more than 300 percent of GDP by 2050.

law" basis when making baseline budget projections, other CBO reports show the implications of alternative assumptions.

For example, CBO's Budget Outlook from August 2006 shows that if all of the revenue side-alternatives—extending recent tax cuts and reforming the Alternative Minimum Tax—are included, and if Iraq and Afghanistan war outlays are assumed to grow with nominal GDP, projected deficits during the next 10 years would be much larger: the 2016 deficit would equal 4.6 percent of GDP ($962 billion /$21,052 billion) instead of just 0.4 percent of GDP under the baseline. Nevertheless, policymakers generally focus on CBO's benign "baseline" projections that stymie pressures for early action on deeper budget reforms.

The CBO's long-range projections also exhibit widely different outcomes. Assuming intermediate federal spending levels and higher revenues (from continuation of current AMT law and bracket creep), federal spending is estimated to increase to 38 percent of GDP by 2050, but federal debt held by the public would increase to just 100 percent of GDP by that year. Under lower assumed revenues (laws are periodically amended to hold revenues at their historical average of 18.3 percent of GDP), the ratio of debt held by the public to GDP explodes to more than 300 percent of GDP by 2050. Such wide variation in possible budget outcomes implies that capital market participants should incorporate high risk or inflation premiums in the interest rates they demand on government debt. However, persistence of low long-term interest rates suggests that capital markets may be weighting downside budget risks insufficiently.

The Federal Reserve's Emphasis on Price Stability

The Federal Reserve's strong emphasis on maintaining price stability is grounded in the belief—supported by historical experience—that there is no stable and exploitable tradeoff between inflation and unemployment. That perspective holds that price stability itself delivers maximum sustainable economic growth by helping individuals and firms to clearly perceive the true tradeoffs involved in different uses of their resources.

However, is the Federal Reserve committed to delivering price stability permanently or just "current" price stability? According to Sargent and Wallace (1981), the extent of the Fed's commitment is important in determining the course of fiscal policy adopted by the Fed's principal—Congress. By most accounts, that study is said to reveal the dire implications of lax fiscal discipline for future inflation. In the short term, the Fed's effective commitment to maintaining

price stability clearly contributes toward maintaining a benign or favorable economic outlook. As such, it may be helping to prolong the fiscal policy logjam—thereby worsening the long-term fiscal outlook. Fiscal policymakers may (erroneously) believe that delays in adopting fiscal reforms will not prove costly because the Fed's actions would ensure a robust economy. Furthermore, although fiscal policymakers may believe that the Fed would remain steadfast in delivering price stability, their failure to undertake pro-active policies to resolve fiscal imbalances and, indeed, continued enactment of policies that worsen them, could unhinge the Fed's ability to maintain price stability. The next section explores this line of reasoning in greater detail with reference to Sargent and Wallace's (1981) "unpleasant monetarist arithmetic."

### Growing Foreign Ownership of U.S. Government Debt

The government's current policies—generous entitlement benefits, high (war-related) discretionary spending growth, and low taxes—may be maintained for a few more years—but only as long as foreign savers continue to lend resources to the United States at low interest rates. Such "pro-consumption" policies have caused rapid growth in U.S. goods and service imports, increased the trade deficit, and made the U.S. net investment position vis-à-vis the rest of the world more negative. According to the U.S. Bureau of Economic Analysis, the U.S. net asset position—U.S.-owned assets abroad minus foreign-owned assets in the United States—is at an all-time low of –$2.6 trillion, and the U.S. current account balance reached –$791 billion during 2005.[13]

Foreign borrowing capacity is an important component of the "debt constraint" that the federal government may confront as population-aging-related budget deficits begin to accrue. The recent trend of foreign capital inflows in the United States indicates that the share of U.S. government debt held by foreign residents and institutions increased especially rapidly during the 1990s—from 21 percent in 1994 to 53 percent in 2004 (Figure 1). A similar trend—of increasing nonresident-held government debt share—is evident in European countries (Figure 2).

When today's consumption-oriented fiscal policies encounter a binding debt constraint will depend on how much longer that trend continues via foreigners' desire for high saving and for parking those

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[13]Measured at current cost. See the comparison between U.S. net investment positions for 2004 and 2005 in the latest BEA bulletins available at www.bea.gov/bea/di/intinv05_t1.xls and www.bea.gov/bea/newsrelarchive/2006/trans206.xls.

FIGURE 1

SHARE OF FOREIGN-HELD IN TOTAL PRIVATELY HELD
TREASURY DEBT
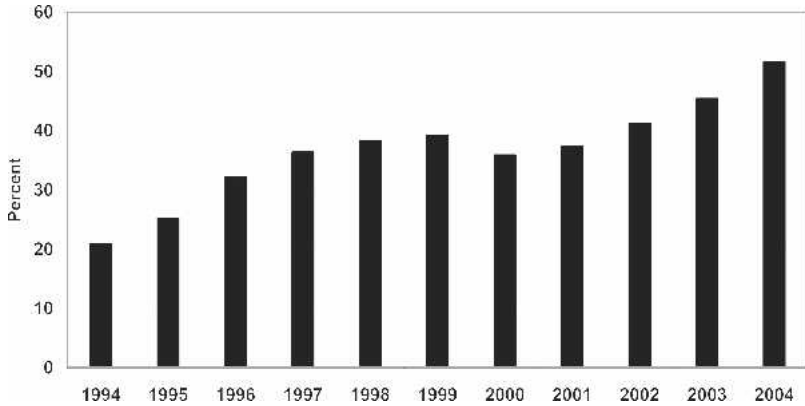
funds in U.S. Treasury securities. If and when the constraint becomes
effective, the federal government will be forced to increase taxes and
cut benefits to avoid sharp increases in interest rates from growing
federal deficits. However, the longer that the current political logjam

FIGURE 2

MARKETABLE GOVERNMENT DEBT HELD BY NONRESIDENTS:
SELECTED EUROPEAN COUNTRIES
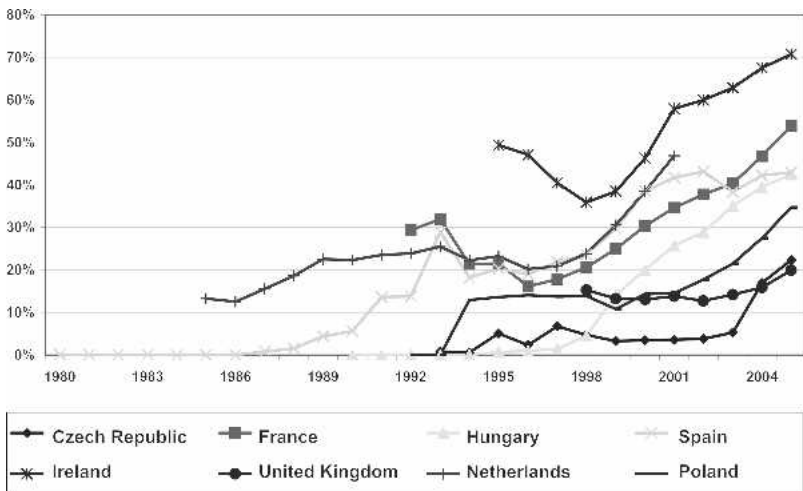
prevents an earlier adoption of such fiscal adjustment, the more the pressure on the Federal Reserve to shift priorities—away from maintaining current price stability and toward accommodating growing federal debt to prevent high interest rates from immediately reducing economic growth and employment.[14] Thus, the current political logjam over fiscal reforms increases the chance of market-precipitated economic and policy adjustments, which would likely cause considerably more damage and impose larger costs on those least able to bear them.[15]

The Monetary-Fiscal Connection

As mentioned in the earlier section, the longer the "prisoners' dilemma" game between the two political parties continues, the more "locked in" future entitlement outlays become. However, the firmer the fiscal authority's commitment to an unsustainable policy (or, in this case, the weaker its commitment to adjust policies), the worse the tradeoff faced by the monetary authority. To explore the link between fiscal commitments and the monetary authority's options, this section provides a brief sketch of the "unpleasant monetarist arithmetic" proposed by Sargent and Wallace (1981). It also briefly describes the rationale underlying the "Fiscal Theory of the Price Level," which confers primacy on fiscal policy in directly determining the price level—without any concomitant monetary expansion. That is followed by a discussion of the implications of the current fiscal stance for monetary policy and vice versa.

The Unpleasant Monetarist Arithmetic

One component of the connection between monetary and fiscal policies is the public's demand for a "monetary" asset—for use, primarily, as an exchange medium. Today's monetary systems depend on "fiat" money issued by the government, which serves as the basic monetary asset—also called "base" or "reserve" money.[16] Total

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[14]It is instructive to note that total EU countries' general government debt amounted to €4.7 trillion by July 2006. This debt level (and the foreign-held component) can only be expected to increase as European population-aging-related budget deficits increase during coming years.

[15]External or total debt constraints are unlikely to be of a fixed magnitude—even as ratios to an income measure such as GDP. New information about productivity, labor market regulations, the prospect of new debt issues, and the likelihood of default mean that the government's ability to borrow for supporting current consumption (or its sensitivity to market interest rates) could change considerably over time.

[16]Government-issued fiat money serves as the basis for the creation of "near money"

money creation by the banking system is limited by the amount of base money in circulation and by "reserve requirements" and other regulations that bank deposits are subjected to by the Federal Reserve System.

Two features of the government's supply of base money are important: First, although base money constitutes its liability, the government pays zero nominal interest to its holders. Therefore, private agents' demand for real money balances is inversely related to prevailing market (nominal) interest rates. The Sargent and Wallace study assumes that real market interest rates (and all real variables such as income and consumption) are fixed. That is, the economy remains in a "real steady state." In turn, that means the private sector's demand for money balances would be inversely related to the prevailing inflation rate. The second component is the Federal Reserve's monopoly over the supply of base money, which enables it to be used as a fiscal instrument to generate seinorage revenues.

The Fed determines how much of the government's outstanding public debt it should purchase in exchange for base money (through "open-market operations") to achieve its current price level (or inflation) objective. A larger fraction of existing government debt held by the central bank (instead of by the public at large) produces larger seinorage revenues.[17] However, it also implies a larger stock of base money circulating with commercial and other banks, and a correspondingly larger potential for increasing the amount of liquid ("monetary") assets in the economy. All other things being equal, a larger supply of liquidity induces proportionally greater inflationary pressure. Given that all real variables are fixed in the "real steady state" economy, an increase in liquid assets by x percent would increase the price level—also by x percent.

Now consider the choices of the fiscal authority that must finance a series of expenditures from its tax receipts through time. Because, like all private citizens, it cannot spend each dollar of revenues (taxes plus seinorage) more than once, any debt incurred to cover past revenue shortfalls must be repaid (or serviced) out of future primary budget surpluses. In addition, the government faces a "debt

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substitutes that also perform "monetary" functions for the private sector—such as bank checking and saving deposits, money market accounts, etc. However, monopoly control over the supply of "base" money enables the government (or the central bank as the government's agent) to control the total amount of monetary assets in the economy.

[17]Each year, the Fed returns earnings on its government bonds portfolio—net of operating costs—to the Treasury.

constraint" defined by the public's unwillingness to hold more than a given amount of real government debt per unit of real income.[18]

Within this framework, monetary policymakers face an intertemporal choice if fiscal policy is pre-committed—that is, if the series of future government nominal revenues, expenditures, and associated deficits are fixed—and the implied future nominal debt levels would breach the private-sector's debt-holding limit. That choice is between achieving lower inflation today versus in the future. Why? Because the Fed would have to generate adequate seinorage to ensure that the public's debt limit is not breached. Then, if the Fed maintained low inflation today by selling government securities and reducing the ratio of liquid to other assets in private agents' portfolios, it would also reduce current seinorage and hasten the day when the private-sector's debt limit becomes binding. That directly implies the need for a compensating increase in seinorage and inflation tomorrow by purchasing government bonds and allowing larger money creation.[19]

The usual interpretation of such "unpleasant monetarist arithmetic" is that a fiscal authority that is committed to a specific policy course can force the Federal Reserve into a dilemma—of choosing lower current inflation at the expense of higher future inflation. But an alternative possibility is that the monetary authority may be able to discipline the fiscal authority by holding steadfast to its price-stability objective through time. In that case, the fiscal authority must retreat from a profligate fiscal policy when its expenditure commitments cannot be financed via additional debt creation.

The key lesson, however, is that both the Federal Reserve and Congress cannot commit to independent and inconsistent monetary and fiscal policies, respectively. A locked-in and irreversible fiscal policy means that the Federal Reserve must eventually coordinate its policy to generate adequate seinorage revenues. As noted earlier, waiting longer to resolve existing fiscal imbalances directly locks in federal expenditure commitments and, if taxes cannot be increased, locks in debt creation. Then the Fed's commitment to maintaining low inflation today directly implies higher inflation tomorrow.

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[18]The debt constraint does not necessarily imply a fixed quantity of government bonds that the private sector is willing to hold. It could reflect an increasingly interest-inelastic demand for government bonds (or supply of loanable funds) at higher levels of total private-sector holdings of those bonds.

[19]Under certain circumstances—especially if today's money demand is highly sensitive to future expected inflation, a monetary policy that promises to deliver a higher pace of future money creation in exchange for slower current money creation may generate higher expected inflation—which, in turn, could increase current inflation despite low current money creation.

The Fiscal Theory of the Price Level

Sargent and Wallace note that the "unpleasant monetarist arith-metic" is consistent with reversing the role of "leader" and "follower." A sufficiently strong commitment by the monetary authority to price stability could be successful *if* it forces the fiscal authority to revert to fiscal prudence. Thus, a strong commitment to price stability by the monetary authority is *by itself* sufficient to guarantee price stability. The fiscal theory of the price level challenges this notion of suffi-ciency and suggests that without an appropriate fiscal policy, the monetary authority's commitment to price stability by itself won't work no matter how strong it is. Thus a central bank should not only be sufficiently independent to set the correct monetary policy; it must also be able to cajole its principal into following a fiscal policy con-sistent with achieving stable prices.[20]

In simple terms, fiscal policy is consistent with price stability if the present value of *expected* future primary budget surpluses equals the real value of outstanding government debt (nominal debt divided by the price index). That is, if

$$(1) \quad \frac{D_t}{P_t} = \frac{\$5 \text{ trillion}}{1}$$

$$= \text{Expected present value of future primary budget surpluses.}$$

Here, D_t represents outstanding government debt and P_t represents the price level in the current period t. P_t is set to unity for simplicity. Equation (1) says that the public's willingness to hold government debt worth \$5 trillion in today's dollars must be supported by an expectation that it will be repaid—that is, future primary surpluses will be sufficiently large to accommodate interest costs of the existing debt of \$5 trillion. Validating that expectation would require the gov-ernment to generate \$5 trillion in future budget surpluses.

According to the FTPL, equation (1) should be viewed not as a constraint on government's intertemporal budget choices, but as an equilibrium condition. Given the monetary authority's commitment to price stability, if the fiscal authority undertakes no adjustments to spending or taxes despite explosive growth in the real value of debt (D_t/P_t), then the FTPL predicts an immediate price level adjustment in order to restore balance between the real value of debt and public

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[20]The speech by Ben S. Bernanke, chairman of the Federal Open Market Committee, to the Washington Economic Club may be viewed under this perspective as an attempt to nudge fiscal policy toward greater prudence—to safeguard the Fed's long-term credibility in delivering low inflation. The speech is available at www.federalreserve.gov/boarddocs/speeches/2006/20061004/default.htm.

expectations about future budget surpluses.[21] Thus, operating a fiscal policy that is considerably out of sync with the requirements of price stability would trigger an inflationary adjustment—even without a fiscally induced monetary expansion.

If the right-hand side of equation (1) is replaced by "present value of future primary surpluses under current policies," we get –$58.7 trillion instead of $5 trillion. That is, the gap between the current fiscal policy stance and the public's expectations about future budget surpluses (which must equal $5 trillion because it voluntarily holds outstanding federal debt) is a massive $63.7 trillion. The FTPL predicts that a sufficiently large gap between the future implications of current policies and the public's expectations would trigger a sudden inflationary surge that equilibrates the two.

Adjustment Alternatives

Since no equilibrating price level adjustments have occurred so far, either the deviation of prospective budget surpluses under "current policy" from those "expected" by the public is not large, or the public expects fiscal policy adjustments to occur sufficiently early to warrant a continuation of the apparent disconnect between the two. However, the difference between the two appears to be quite large, and there appears to be little prospect that the budget policy logjam will be resolved soon.

Note that high deficits and debt accumulation during the 1980s and early 1990s were brought under control by budget constraints adopted between 1990 and 2002.[22] That experience could be driving current public expectations that fiscal policymakers will respond similarly to future increases in debt levels. However, the cause of high deficits during those earlier decades was spiraling discretionary appropriations—especially the defense build-up of the 1980s. Future increases in deficit and debt levels will be driven by entitlement programs, public support for which is considerably stronger. Hence, future deficits are likely to become more difficult to pare back

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[21]Note that the government's budget constraint can assume a price-setting role if the traditional equation of exchange approach is inadequate to fix the price level. That is, either the money supply is endogenous, or the current price level depends on future price expectations—directly, or because short-term movements in output depend on short-term price movements, etc. In such cases, multiple price level sequences through time could be consistent with the equation of exchange, and the government's intertemporal budget constraint could become instrumental in determining which price level path is realized.

[22]The Budget Enforcement Act of 1990 was extended through 2002 and imposed spending caps on discretionary expenditures and anti-deficit increasing PAYGO restrictions on new entitlement expenditure increases.

through spending cuts the longer the fiscal policy logjam continues. A third possibility, however, is that we will witness either a Fed-accommodated increase in inflation or a FTPL-driven price level adjustment in the future as federal spending commitments become firmer, fiscal authorities cannot implement tax hikes for fear of weakening the economy, and investors and the public begin anticipating higher capital and borrowing costs as federal debt grows more explosive than current baseline projections suggest and absorbs investible resources.

Is Federal Reserve Policy Aiding an Unpleasant Fiscal Arithmetic?

As noted earlier, the Sargent and Wallace unpleasant monetarist arithmetic is anchored on a monetarist model wherein real variables—output, employment, consumption, and interest rates—remain fixed irrespective of inflation or government taxes and spending. That's clearly not a good approximation in the short term, and it's also not likely to be true in the long term. Indeed, there is little point in discussing the monetary-fiscal policy tradeoff if profligate fiscal policy affects only inflation and nominal aggregates and has no impact on real economic magnitudes in the long term. The monetarist model is therefore useful only for clarifying the underlying pressures that could force the Fed to monetize a larger share of government debt and trigger permanently faster inflation. Subsequently, this may generate slower productivity growth and permanently reduced employment, output, and consumption.[23]

Note also that the analysis does not pin down which of the two policy authorities (fiscal or monetary) makes a firmer commitment to a prespecified policy rule. As mentioned earlier, most discussions suggest that if the monetary authority sticks to its price stability commitment (say, by announcing a fixed money growth rate rule), the fiscal authority must back down and alter the path of future deficits.

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[23]Permanently higher inflation would result from government debt growth breaching the public's debt-holding limit. It would generate larger inflation-tax revenues to service that debt if fiscal policymakers refuse to increase direct taxes. Some people contend that raising adequate revenues via seinorage would never be feasible. However, whether additional revenue to finance irreversible benefit commitments is eventually obtained from permanently faster inflation or higher direct taxes is not the crucial issue. Rather, it is whether inability or refusal to implement corrective fiscal reforms would compromise the Fed's price stability objective. If it did, interest rates would increase and growth in hours worked, output, and consumption would decline in a high-inflation environment.

But that, again, means higher job-destroying taxes or cuts in benefits and reduced aggregate expenditures.

This "game of chicken" between monetary and fiscal authorities requires one of them to move first and fix a sequence of policy actions *throughout the future*. The other authority must then coordinate its actions to the fixed policy of the first authority, given the budget constraint it faces. In reality, however, announcing and adhering to a policy rule in perpetuity are obviously not how policies are made. Under existing political and economic institutions, fiscal and monetary policymakers may have different operational time horizons. It seems reasonable to assume that fiscal policymakers have shorter time horizons over which to achieve their personal or political goals—as dictated by relatively short electoral cycles and the uncertainty of electoral outcomes. The Federal Reserve, however, has an extended "institutional" memory because of its long-serving personnel and operational traditions. In addition, the Federal Reserve makes effective policy adjustments throughout the year whose sizes can be calibrated to emerging economic information, whereas tax policies take time to enact and are subject to lobbying and manipulation by particular interest groups.

In such an institutional environment, the Federal Reserve's current and apparently firm commitment to maintaining price stability could be generating an "unpleasant fiscal arithmetic." Each generation of relatively shortsighted fiscal policymakers may have the incentive to postpone implementing unpopular policies and "pass the buck" to the next generation of fiscal policymakers. And such postponement becomes more feasible if policymakers and the public are convinced of a continued benign or favorable economic outlook. One element aiding such an outlook is the Fed's effective commitment to low inflation and inflation expectations. In the meanwhile, however, the large fiscal imbalance accrues interest and grows larger. Indeed, a Fed-supported benign economic outlook may encourage fiscal policymakers to undertake *additional* unfunded spending commitments without much risk of immediate adverse economic effects.[24]

According to this reasoning, the Fed's high credibility in delivering current price stability may eventually worsen the tradeoffs that future fiscal policymakers (and, as conjectured by Sargent and Wallace, future monetary policymakers) will face. Indeed, with relatively

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[24]Note that, in the monetarist model of Sargent and Wallace (1981), there can be no adverse impact on real output, consumption, or interest rates. To the extent those assumptions are not satisfied in the real world, faster current inflation may have adverse effects on real output, employment, etc. and spoil the expectations coordination discussed in the text.

shortsighted fiscal policymakers, such a worsening may emerge from cumulatively profligate policies adopted by successive groups of fiscal policymakers when no such (binding) tradeoff existed to begin with. As mentioned earlier, recent policy decisions to increase the size of the U.S. fiscal imbalances appear consistent with such reasoning.

Does it follow, then, that the monetary authorities should *not* pursue price stability as steadfastly? Not necessarily. That's because although recent emphasis on price stability appears not to have improved fiscal discipline—and, perhaps, may have contributed to lax fiscal policies—it does not imply that the alternative of allowing faster inflation would induce better behavior among fiscal policymakers. The bottom line is simply that the Fed's current commitment to price stability may be temporarily helping to prolong rather than resolve the political logjam and the federal fiscal imbalance is growing larger as time passes. The Fed's future commitment to price stability would have to be extremely rigid and unyielding if faster inflation is to be avoided as a means of resolving that imbalance—and it would work only if the FTPL's potential impact remains dormant.

Conclusion

The game between monetary and fiscal policymakers is usually analyzed with reference to the unpleasant monetarist arithmetic. That analysis suggests that if one of those policymakers leads by setting an immutable policy rule, the other must follow and coordinate its policy with the leader in order to satisfy the government's intertemporal budget constraint. When the monetary authority is the follower and the federal government's predetermined fiscal policy breaches the public's debt-holding limit, the Fed's policy tradeoff consists of achieving low inflation today or low inflation tomorrow, but not both. Despite its commitment to maintaining price stability, it must eventually monetize a larger share of government debt and help finance the government's precommitted outlays. Alternatively under the fiscal theory of the price level, budget policies that are inconsistent with the real value of outstanding government debt would trigger an inflationary realignment of prices independent of any monetary accommodation of government debt. The FTPL, however, lacks adequate empirical validation as yet.

This article describes the economic forces sustaining the current stalemate on reforms to resolve large existing fiscal imbalances under current policies. The budget reform logjam—a conflict between preferences over inter- and intra-generational redistribution—appears to be sustained by three elements: current budget reporting that helps policymakers to highlight a benign budget outlook, a surge in global

saving allowing continuation of pro-consumption fiscal policies, and the Federal Reserve's current commitment to maintaining price stability that helps to coordinate the public's and policymakers' expectations about a benign or favorable economic outlook.

Unfortunately, under alternative and perhaps more realistic assumptions, the fiscal outlook is far from benign. Calculations based on extended official budget data suggest that current policies imply a fiscal imbalance (in perpetuity) of $67.2 trillion that must be paid out of future revenues or reduced via government expenditure cuts. Social Security and Medicare appear to be the chief sources of the large fiscal imbalance.

Finally, the article suggests the possibility that the Fed's commitment to price stability may be assisting an unpleasant fiscal arithmetic by relatively shortsighted fiscal policymakers. Under expectations of a stable or favorable economic outlook over the short term and of a Fed steadfastly delivering price stability, fiscal policymakers have recently enacted massive increases in government expenditure commitments. If the political logjam remains unresolved, outstanding fiscal imbalances will grow larger over time, forcing larger future debt creation that may push the Federal Reserve off its emphasis on price stability. In that case, current projections of a benign economic outlook won't be validated. Whether the much-lauded independence of the Federal Reserve is ensuring sustainable economic growth without inflation or contributing to the eventual weakening of the economy and faster future inflation is still an open question.

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