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Macroeconomic Effects of Social Security and Tax Reform in the United States

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Abstract

We use the IMF's Global Fiscal Model to evaluate recent proposals to reform social security and the tax system in the United States. Introducing personal retirement accounts is unlikely to yield significant macroeconomic benefits unless it spurs additional fiscal consolidation to prevent a large increase in government debt. Similar benefits are obtained if the social security surplus is placed in a lockbox while maintaining the same debt target. Lowering the taxation of investment income is beneficial, but only if the reform is revenue neutral. Debt-neutral social security and tax reform in the United States has large positive effects on the rest of the world.

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Keywords: Personal retirement accounts, fiscal consolidation, tax reform, global fiscal model

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[1] This paper is an extension of Bayoumi and others (2005). We are grateful for comments by Christopher Towe, Martin Mühleisen, Iryna Ivaschenko, and Kornélia Krajnyák.

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I. INTRODUCTION

The U.S. Administration has proposed two major fiscal initiatives recently—introducing personal retirement accounts (PRAs) and tax reform. PRAs would allow individuals to divert some of their Social Security payments into private accounts while reducing their "traditional" benefits from the system. Regarding tax reform, a presidential advisory panel has been asked to report on ways to make the U.S. tax system simpler and more efficient and more supportive of growth through raising the personal saving rate.

This paper investigates the macroeconomic effects of introducing PRAs and reducing the double taxation of savings. For this purpose we use a two-country version of the IMF's Global Fiscal Model (GFM), calibrated to the U.S. economy. GFM is a theory-based annual simulation model that is fully anchored in rigorous microeconomic theory and has been developed specifically to examine a range of fiscal issues.[2]

The paper first considers the effects of introducing PRAs without other fiscal measures. Then, it considers the introduction of PRAs coupled with measures to prevent PRA-related increases in government debt. These measures include an increase in labor income, personal income, or corporate income taxes, or a combination between higher labor income taxes and lower government spending.

Next, the effects of fiscal adjustment assuming that the level of government debt is lowered by the asset accumulation associated with Social Security surpluses is examined. At present, the fiscal position is flattered by the inclusion of the Social Security surplus in the unified budget. One could make the case that fiscal transparency and discipline could be enhanced if the surpluses were to be placed in a "lockbox." If the same deficit objective is maintained, this requires a substantial fiscal consolidation, which will not only affect the U.S. economy, but also the rest of the world through its effect on world interest rates.

Finally, the paper explores how reducing the personal income taxation of capital income could affect the economy. More specifically, we study two reform scenarios. In the first scenario, capital income is no longer subject to personal income taxation, eliminating the double taxation of savings. The loss in revenue is compensated by raising labor income taxes. This provides insight into the distortionary nature of different taxes, and therefore the potential efficiency gains of tax reform. In the second scenario, we consider the same reform as above, but in a non-revenue neutral way. Labor income taxes are raised insufficiently to compensate for the lost revenue from eliminating the double taxation of savings, implying that government debt will increase, and the reform may have to be undone.

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[2] See Botman and others (2005) for a description of GFM. Botman and Laxton (2004) have applied the model to study the effects of U.S. tax cuts. Bayoumi and others (2005) examine the long-term benefits from reducing government debt by delaying tax cuts as well as issues of tax spillovers within the context of Canada's rapid reduction in government debt. See Bayoumi (2004) for a discussion of the overall modeling effort.

The rest of the paper is organized as follows. Section II describes the structure of GFM as well as its calibration to the U.S. economy. Section III considers the introduction of PRAs, both when debt increases and when it is combined with alternative forms of fiscal consolidation. Section IV analyzes the effects of placing social security in a lockbox while maintaining the same debt target. Section V discusses the effects of eliminating the double taxation of savings. Social security and tax reform in the United States affects the rest of the world, and these spill-over effects are the subject of Section VI. Section VII concludes.

II. THE MODEL AND CALIBRATION

With the emergence of the New Open Economy Macroeconomics (NOEM) paradigm, studying macroeconomic interdependence across countries has centered on monetary policy with much less attention directed at fiscal issues. Indeed, standard NOEM models typically specify an infinitely-lived representative agent in a perfect-foresight setting with nondistortionary taxation implying that the Ricardian equivalence hypothesis holds and the analysis of fiscal policy is confined to studying the effects of balanced-budget fiscal policies.

GFM however, is a NOEM model suitable for the evaluation of alternative fiscal policies when Ricardian equivalence does not hold. For the two-country version of GFM used in this paper, there are two reasons why Ricardian equivalence does not hold:[3]

- The private sector is assumed to be more "impatient" than implied by the government budget constraint. This follows from the overlapping-generations structure of the model—consumers have finite lives as they face a constant probability of death. Because the private sector uses a discount factor that is higher than the real interest rate, the effects of future policy actions are discounted more rapidly than is implied by the government budget constraint. As a result, fiscal policy changes influence national saving.
- Markets are not fully competitive. Firms and workers have some monopolistic power, so that prices and wages are above their perfectly competitive levels. Labor income taxes affect the work-leisure trade off. In addition, profits reflect both returns to capital and economic rents extracted by firms. Compared with the case of perfect competition, these rents reduce the distortionary impact of corporate and personal income taxes.

The model involves a stylized representation of the U.S. tax system and the structure of public expenditures. The analysis incorporates three taxes: a labor income tax levied on wage compensation; a corporate income tax levied on accounting profits of firms; and a personal income tax levied on labor income, accounting profits, government transfers, and interest income (on government bonds and net foreign assets). It is assumed that for all three taxes, there is a single marginal rate, which coincides with the average tax rate. Revenues raised by

[3] In Botman and others (2005), an additional reason why the Ricardian equivalence hypothesis does not hold is the presence of rule-of-thumb consumers who have no access to capital markets, but instead consume their entire disposable income.

taxation are spent on lump-sum transfers to consumers, government consumption of nontraded goods, and servicing government debt.

Other main aspects of the model can be briefly summarized as follows:

- Consumption and production are characterized by constant elasticity of substitution utility and production functions, respectively.
- Labor and capital are used to produce either traded or nontraded goods.
- Investment is driven by a Tobin's Q relationship, with firms responding sluggishly to differences between the future discounted value of profits and the market value of the capital stock.
- International capital mobility is perfect, implying the equalization of real interest rates across countries over time.
- Wages and prices are fully flexible. Correspondingly, the central bank follows money targeting.
- The model's financial market block is highly stylized. There are two kinds of assets, namely government debt (that can be traded internationally) and equity (which is held domestically).

The model has been parameterized to reflect key macroeconomic features of the United States and the rest of the world (RoW). In particular, the macroeconomic structure of the economy—the ratios of consumption, investment, government spending, wage income, and income from capital relative to GDP—is calibrated to the U.S. economy. Similarly, fiscal variables—taxes rates on capital, labor, and personal income, and government debt—have been calibrated to correspond to the U.S. fiscal structure. The size of the U.S. economy is around one-third of the world economy. Consequently, U.S. policies have a substantial impact on the global rate of interest.

Behavioral parameters are based on microeconomic estimates and set equal across the United States and the RoW. These include parameters characterizing real rigidities in investment, markups for firms and workers, the elasticity of labor supply, the elasticity of substitution between labor and capital, the elasticity of intertemporal substitution, and the rate of time preference.[4]

Simulations examine the impact of changing the values of the following key parameters:

- The sensitivity of labor supply to the real wage (Frisch elasticity): the baseline value (-0.04) is mid-range in the values found by microeconomic studies. Alternative simulations assume values around the upper and lower limits of these estimates (-0.08 and -0.01, respectively).

[4] See Laxton and Pesenti (2003) for a more detailed discussion of evidence on parameter values.

- The elasticity of substitution between labor and capital in the production function: the baseline value is -0.8, with alternative simulations using values of -0.6 and -1 (the Cobb-Douglas case).
- The elasticity of intertemporal substitution: the baseline value for this parameter that describes the sensitivity of consumption to changes in the real interest rate is -0.33. Parameter values in alternative simulations (-0.2 and -0.5) are consistent with the lower and upper end of microeconomic estimates.
- The wedge between the rate of time preference and the yield on government bonds: this parameter—which determines consumers' degree of impatience—has not been subject to extensive microeconomic analysis. Comparing real interest rates charged to consumers on credit card debt (the main source of unsecured loans where the lender takes the full risk of default) and government debt indicates that this wedge may be substantial. Based on this, we set the baseline value of the wedge to 10 percent, with alternative simulations using 5 percent and 15 percent values.

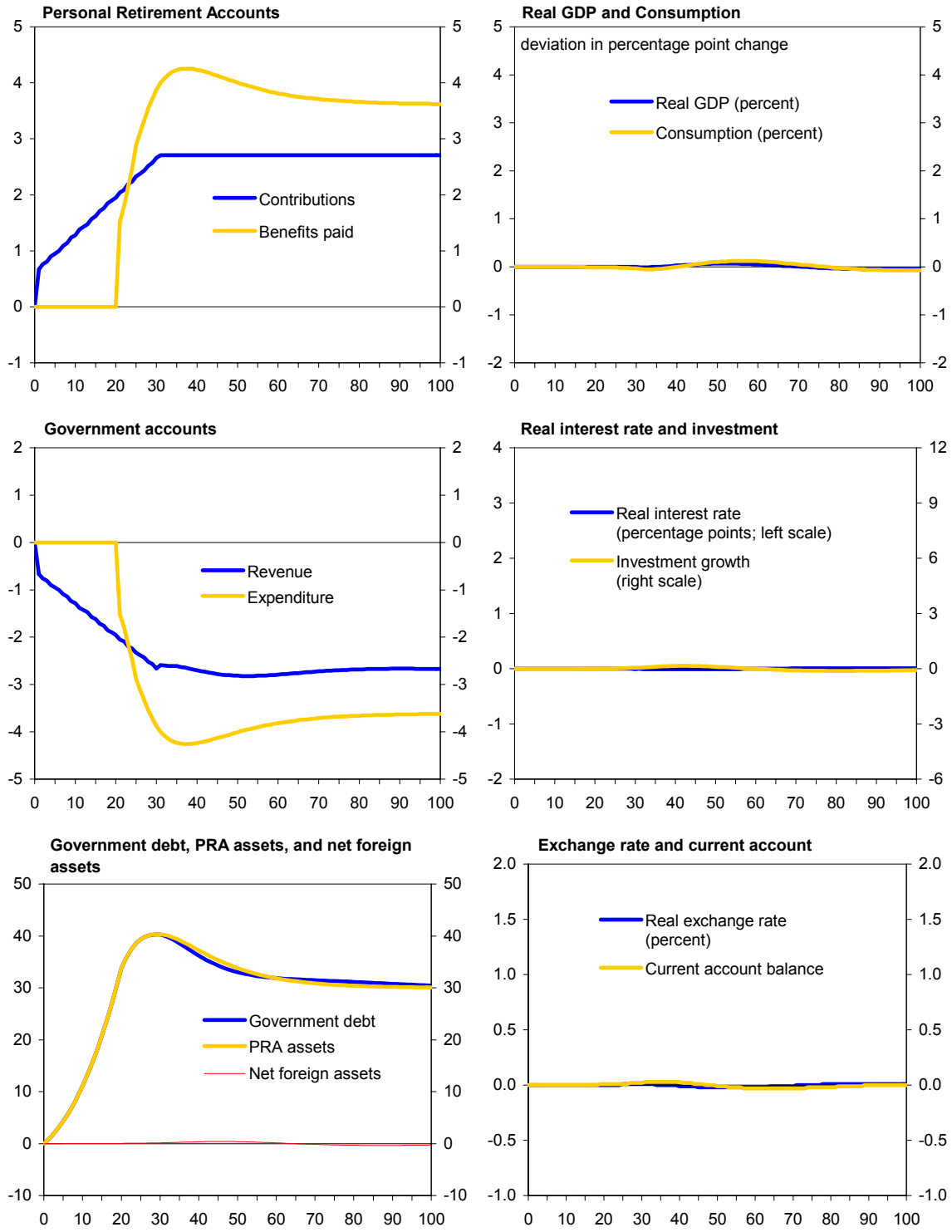
The impact of fiscal policy on real activity combines responses from aggregate supply and demand. Aggregate supply changes are triggered through the "distortion channel." Fiscal policy influences include the impact of wage taxes on the incentive to work and the effect of corporate income tax rates on the rate of return of capital. Aggregate demand changes largely depend on fiscal policy's effects on wealth and interest rates. The strength of the wealth channel is influenced by the level of consumer "impatience." Fiscal policy also affects the global real interest rate, with consequences for investment and private savings, and spillovers on the RoW (see also Kumhof, Laxton, and Muir, 2005).

III. INTRODUCING PERSONAL RETIREMENT ACCOUNTS (PRAS)

The modeling of PRAs in GFM is assumed to follow the U.S. Administration's proposals closely:

- Workers can divert part of their labor income taxes from social security contributions into PRAs. Initially, the amount workers can divert is US$1,000, which increases by US$100 each year to a maximum of US$4,000. PRAs would be phased in gradually for younger workers.
- The PRA system matures after 45 years. It is assumed that workers up to the age of 45 can participate and that they retire at 65, so that PRAs start paying benefits after 20 years. However, contributions to PRAs exceed benefit payments for a further 25 years, when the youngest workers that participated at the start of the program (assumed to be 20 years old) reach retirement.
- Withdrawals from PRAs result in equal reductions in government transfers. Reflecting the stylized nature of financial markets in the model, there is no equity premium to be exploited by owners of PRAs.

Figure 1. Effects of Introducing Personal Retirement Accounts (PRAs)
(Deviation from baseline in percent of GDP unless otherwise noted)



Source: IMF staff estimates.

A. The Macroeconomic Effects of PRAs

Simulation results suggest no significant impact from PRAs on GDP, national saving, and financial markets, but indicates a significant increase in federal deficits and debt over several decades (Figure 1). As payroll contributions are diverted from the Social Security system to PRAs, government revenue declines markedly, falling by 3½ percentage points of GDP relative to the baseline after about 20 years. As a result, government debt is 40 percent of GDP above baseline after 20 years. However, when benefit payments from PRAs start, "traditional" Social Security payments decline by a corresponding amount, which allows government deficits and the debt ratio to fall. In the long run, government debt exceeds the baseline by 30 percentage points of GDP (for a similar estimate see, Orszag, 2005).

As private saving through PRAs offset government dissaving, there is no impact on national saving. Real interest rates are virtually unchanged and there is little effect on investment. It should be emphasized that these results follow from the stipulation that workers cannot borrow against accumulated savings held in their PRAs. In this case, a shift from government to private saving does not affect perceived wealth, and there is no change in consumer behavior.

B. Effects of PRAs if Workers Expect Higher Social Security Transfers

Introducing PRAs could, however, lead to perceptions of higher future transfer payments. Survey evidence suggests that workers, especially younger ones, are skeptical about the value of their future Social Security benefits, possibly reflecting the underfunded nature of the Social Security system. Placing contributions into individual accounts could be interpreted as reducing the likelihood of the government reneging on future benefit payments. Workers could perceive this as an effective increase in their permanent income.[5]

To simulate this, we assume a smaller decline in Social Security benefit payments after PRAs start, financed by a delayed and gradual increase in labor income taxes (Figure 2). The results suggest a mild rise in consumption and output compared to the baseline. However, this effect dissipates when taxes increase to pay for higher transfer payments, leaving the economy worse off starting after 25 years, before returning to the baseline in the long run.[6]

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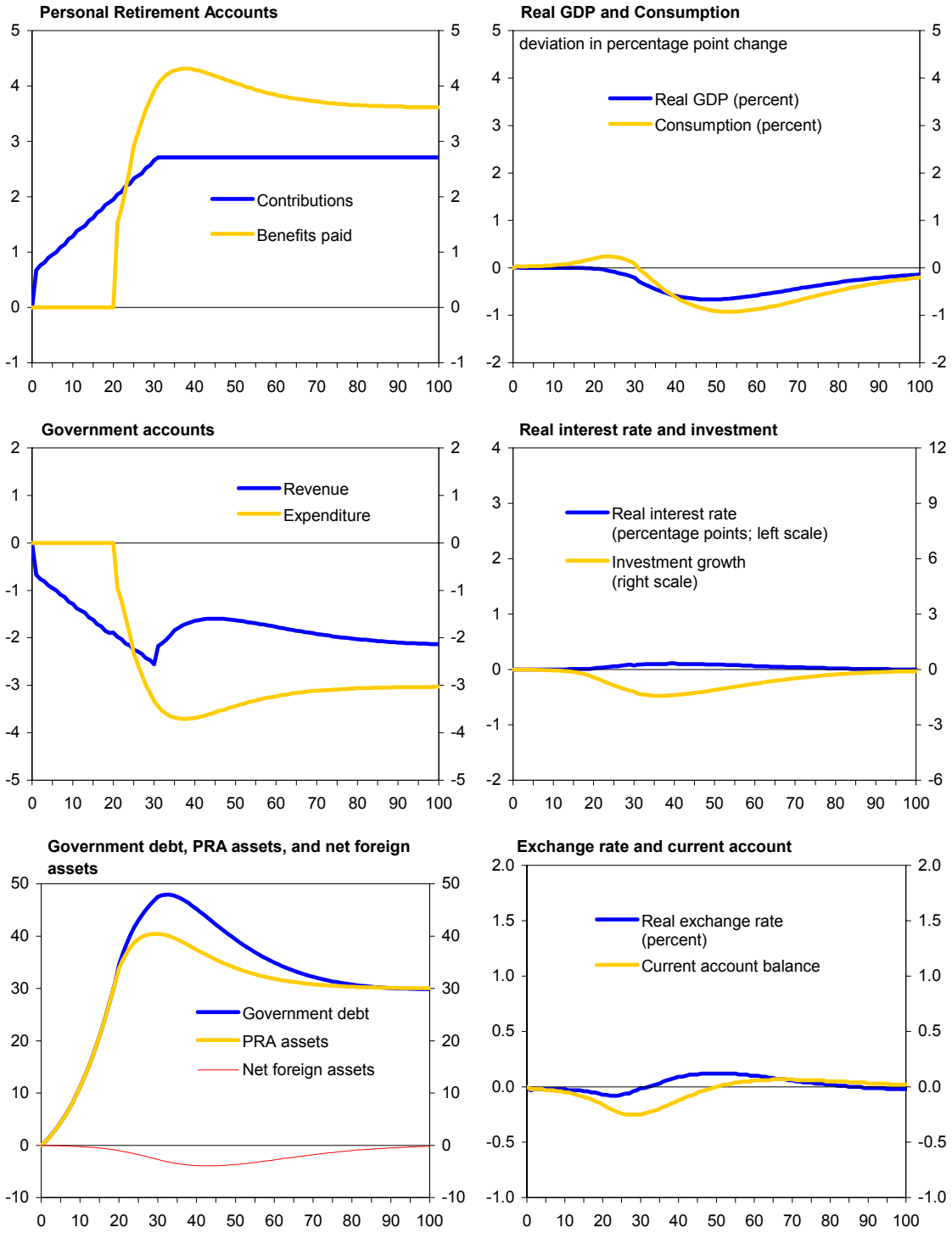
[5] However, if workers currently assume that the government will not fully meet its promises, this also implies that workers correspondingly should expect a smaller increase in future government debt or taxes in the absence of PRAs.

[6] Financial markets may also expect PRAs to lead to an additional increase in government debt. Financial markets may underestimate implicit liabilities in anticipation of future reforms of benefits that reduce payment obligations of Social Security. If PRAs increase the estimated size of future liabilities by making implicit debt explicit, the risk premium on government bonds may increase.

Figure 2. Effects of Introducing PRAs If Future Benefits are Assumed To Be Higher
(Deviation from baseline in percent of GDP unless otherwise noted)



Source: IMF staff estimates.

C. Fiscal Discipline and PRAs

Significant macroeconomic benefits may accrue when PRAs are accompanied by greater fiscal discipline that prevents PRA-related increase in government debt (Figure 3). By making future liabilities explicit, PRAs could increase pressure to offset the resulting increase in government debt. Assuming such deficit reduction is achieved, through higher labor income taxes, output falls modestly below the baseline over the short run. Over the longer run, higher government saving and lower government debt reduces the real interest rate and boosts investment.

Simulation results suggest that the short-run effects are broadly invariant to whether taxes are raised on labor income, corporate income, or personal income, although labor income tax-based consolidation appears to yield quicker but smaller long-run benefits (Table 1). The reason is that labor income taxes are less distortionary compared to personal and corporate income taxes given the relatively low elasticity of labor supply. Fiscal consolidation through higher corporate income taxes provides larger long-term output and consumption gains when these taxes can be reduced after traditional benefit payments decline. Intermediate results are obtained for personal income taxes, since its base combines both labor and corporate income.

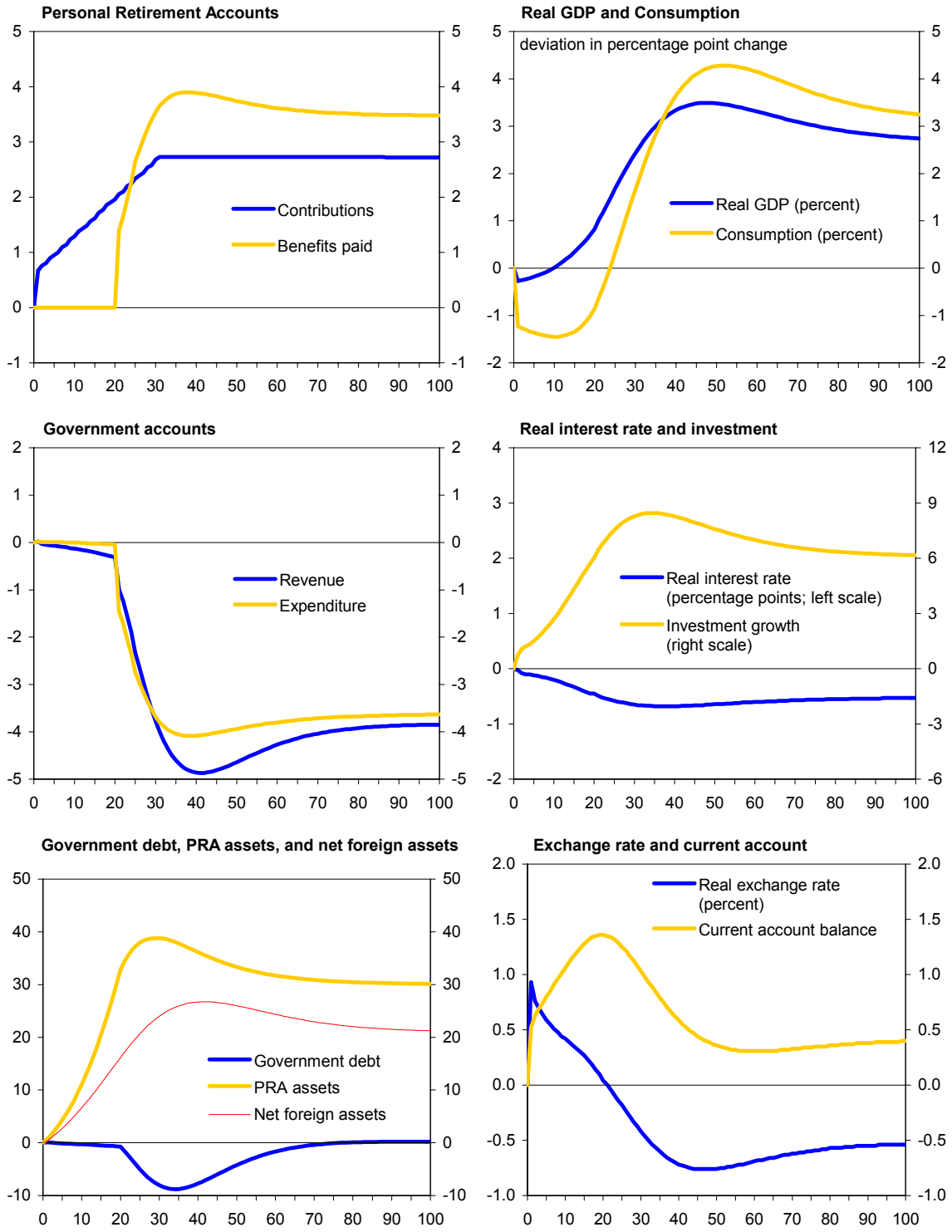
Regarding the sensitivity of the results to the parameters of the model, the long-term gains of fiscal consolidation depend particularly on the planning horizon of consumers (Figure 4). Labor income tax-based consolidation yields greater long-run gains to GDP if consumers discount future tax reductions more rapidly, which induces higher saving and capital accumulation. If capital and labor are closer substitutes, or consumers are less sensitive to changes in the real interest rate, fiscal consolidation leads to smaller output losses in the short run, but has a larger and earlier expansionary effect over the long term.

Table 1. PRAs with Fiscal Consolidation: Impact of Different Tax Measures on Simulation Results
(long-term effect (in percentage points relative to baseline))

	GDP	Consumption	Real interest rate
Labor income taxes 1/	2.68	3.14	-0.52
Personal income taxes	2.98	3.33	-0.55
Corporate income taxes	3.26	3.51	-0.58
Labor income taxes and government spending 2/	2.87	3.34	-0.52

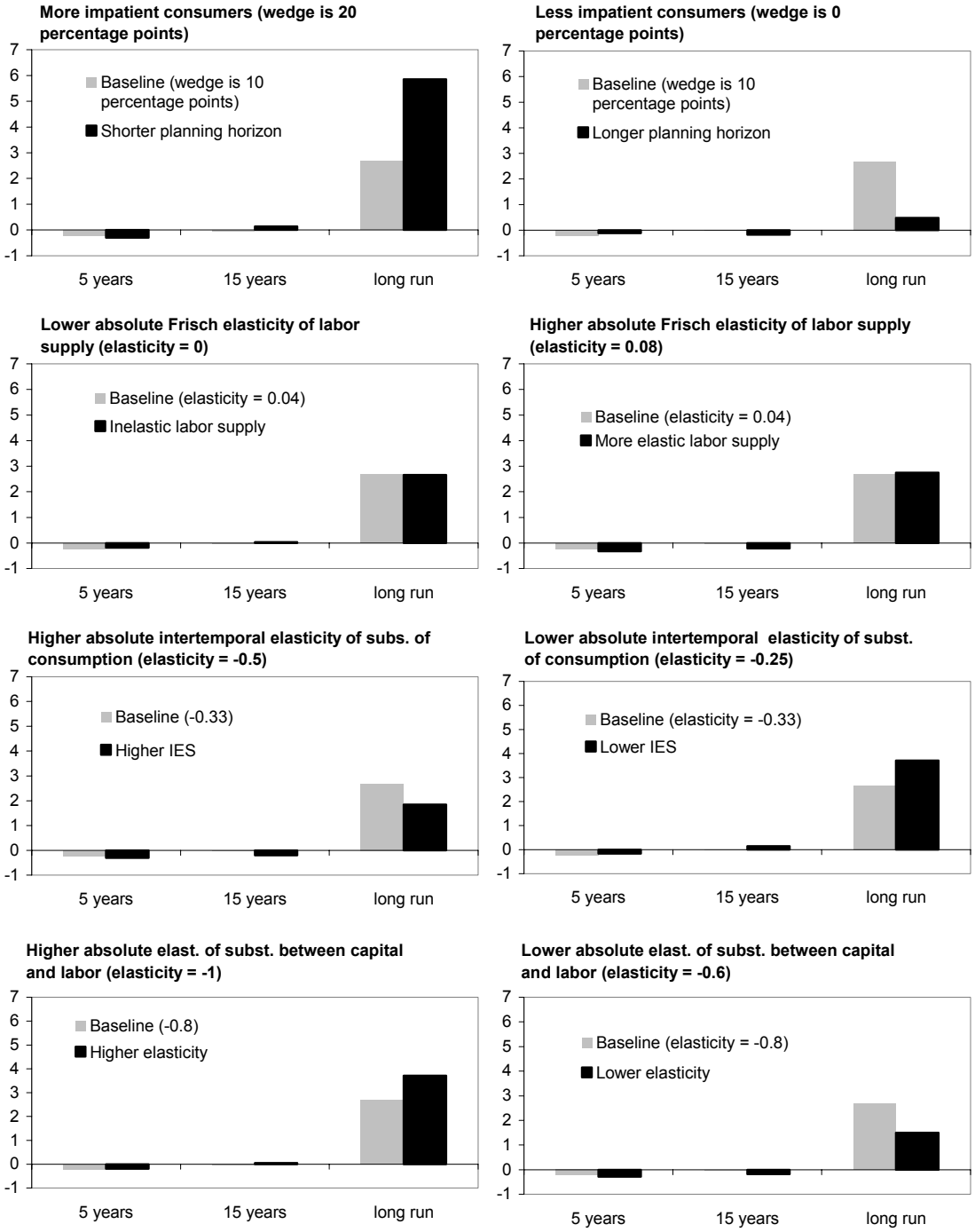
1/ See Figure 3.
2/ A combination of higher labor income taxes and a gradual, but permanent reduction in (lump-sum) government transfers.

Figure 3. Effects of Introducing PRAs Accompanied by Debt Consolidation
(Deviation from baseline in percent of GDP unless otherwise noted)



Source: IMF staff estimates.

Figure 4. Effects of Debt Consolidation on Real GDP Under Alternative Parametrizations [1]
(Percent deviation from baseline)

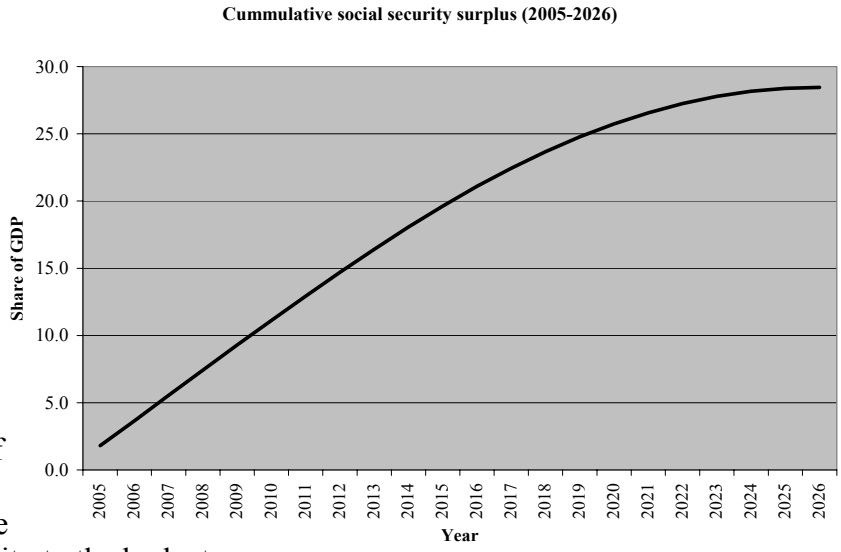


Source: Fund staff calculation

[1] Debt consolidation via labor income taxes; 5 years refers to average impact during first five years, similarly for 15 years, and long-run is new steady state value.

IV. SOCIAL SECURITY LOCKBOX

Asset accumulation associated with Social Security surpluses is projected to be about 28 percent of GDP until 2026 when inflows are expected to equal outflows. After 2026, when social security will record deficits, regulations require increasing social security contributions. At present, these surpluses are included in the unified budget, improving the fiscal position.



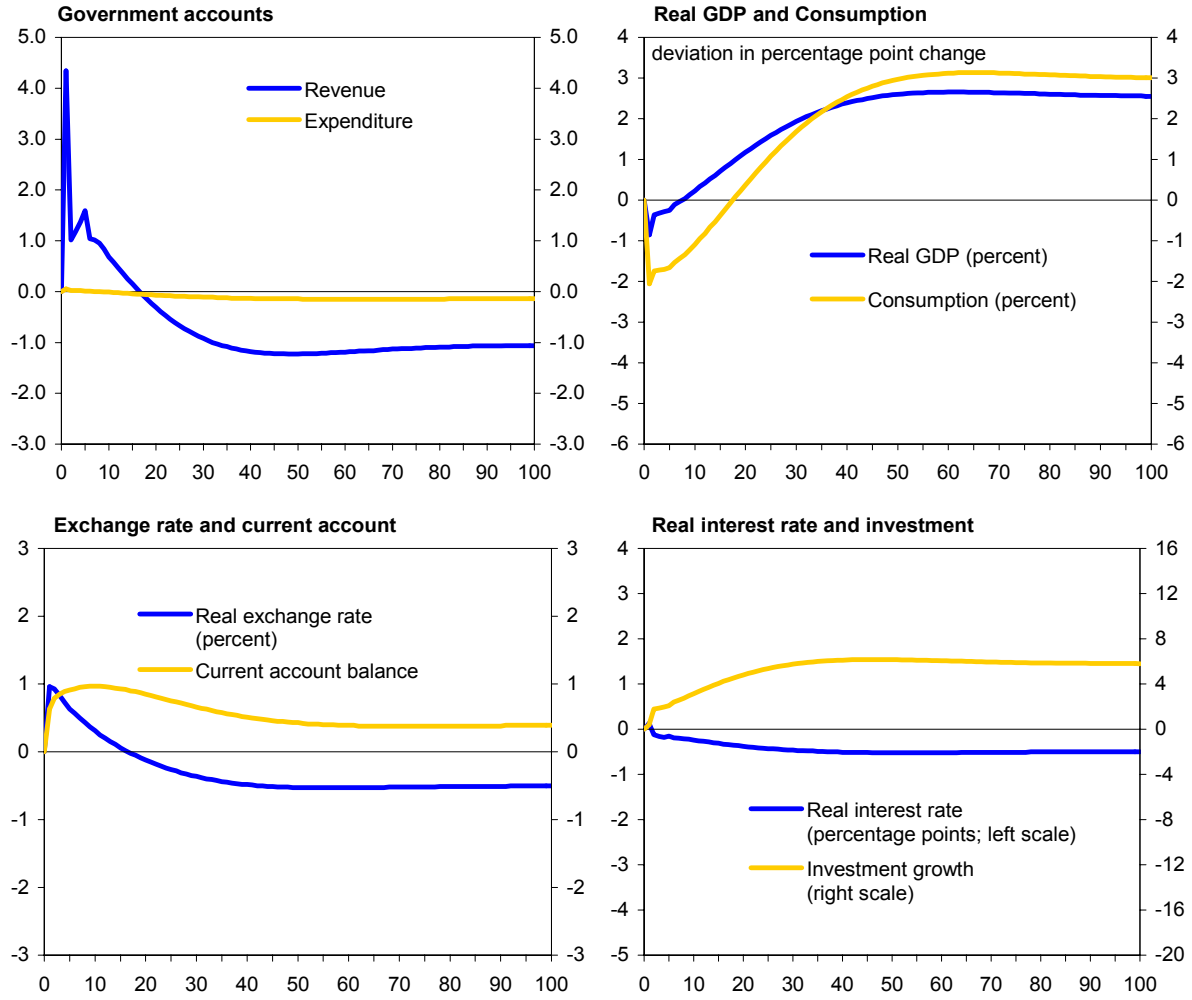
One could make the case that fiscal transparency and discipline could be enhanced if the surpluses would be placed in a "lockbox". Indeed, proposals for such a "lockbox" have been discussed repeatedly since at least the mid-1990s with the twin objectives of safeguarding the viability of the Social Security system and highlighting the positive contribution of Social Security to the budget.

"Lockboxing" Social Security surpluses could yield further long-term benefits (Figure 5). The simulation assumes that after the lockbox, the same deficit objective is maintained. This requires a substantial fiscal consolidation, equal to 28 percentage point reduction in government debt excluding social security. This consolidation is achieved by raising labor income taxes.

PRAs could lead to fiscal discipline through recognition of future unfunded liabilities. However, as the simulations indicate, the same objective could be achieved faster and more directly by tightening fiscal policy to preserve current and future Social Security surpluses thereby helping to ensure that these assets are available to fund future benefits. In the short run, labor supply would decline, and both consumption and output would be modestly adversely affected. However, over time lower public debt allows for lower labor income taxes, interest rates decline, boosting investment and real GDP.

Simulation results indicate that the long-run gains of a social security lockbox would be larger if the same debt target would be maintained by increasing corporate income taxes (Table 2).

Figure 5. Effects of a Social Security "Lock Box"
(Deviation from baseline in percent of GDP unless otherwise noted)



Source: IMF staff estimates.

Table 2. Social Security Lockbox with Same Deficit Target:
Impact of Different Tax Measures on Simulation Results (long-term effect (in percentage points relative to baseline))

	GDP	Consumption	Real interest rate
Labor income taxes 1/	2.55	2.99	-0.50
Personal income taxes	2.84	3.17	-0.53
Corporate income taxes	3.11	3.35	-0.55
Labor income taxes and government spending 2/	2.74	3.19	-0.50

1/ See Figure 5.
2/ A combination of higher labor income taxes and a gradual, but permanent reduction in (lump-sum) government transfers.

V. Effects of Reducing the Taxation of Savings

Since the personal income tax base includes profits of firms, the return to capital can be taxed twice. GFM reflects the traditional view that taxation of dividends negatively affects capital accumulation.[7] Narrowing the personal tax base to labor and interest income—eliminating the personal income taxation of capital—should therefore reduce economic distortions.

Eliminating the personal income taxation of capital in a revenue neutral manner has significant long-term positive effects (Figure 6). In the short-run, narrowing the personal income tax base while raising rates on labor income to prevent revenue losses causes a small decline in real GDP as higher labor taxes damp consumption. Over time, however, national saving increases substantially, the interest rate declines, and capital accumulation results in output increasing about 2 percentage points above baseline.[8]

Narrowing the tax base without increasing tax rates sufficiently, however, is inferior to the status quo as it increases government debt and distortions. The simulation assumes that labor income taxes are increased by the same amount as personal income taxation of corporate income is reduced. In other words, this type of reform ignores the fact that the personal income tax base is broader than the labor income tax base. The consequences of this "failed reform," which is assumed to be reversed after 5 years, are illustrated in Figure 7.

As personal income tax rates are raised to repay the increase in government debt over the reform period and in the long run, there is effectively no beneficial impact on investment or GDP. Simulations in which the reversal of the reform occurs after 10 years (not reported for the sake of brevity) find even larger transition costs.

The long-run benefits from revenue-neutral tax reform depend on the planning horizon of consumers as well as the substitutability between capital and labor (Table 3). A longer planning horizon (more patient consumers) suggests that incentives to save are stronger after the tax reform, which induces a larger reduction in the real interest rate, greater capital accumulation, and larger long-run gains in output. Higher substitutability between labor and capital amplifies distortions from the taxation of capital; thus, eliminating it can yield larger gains.

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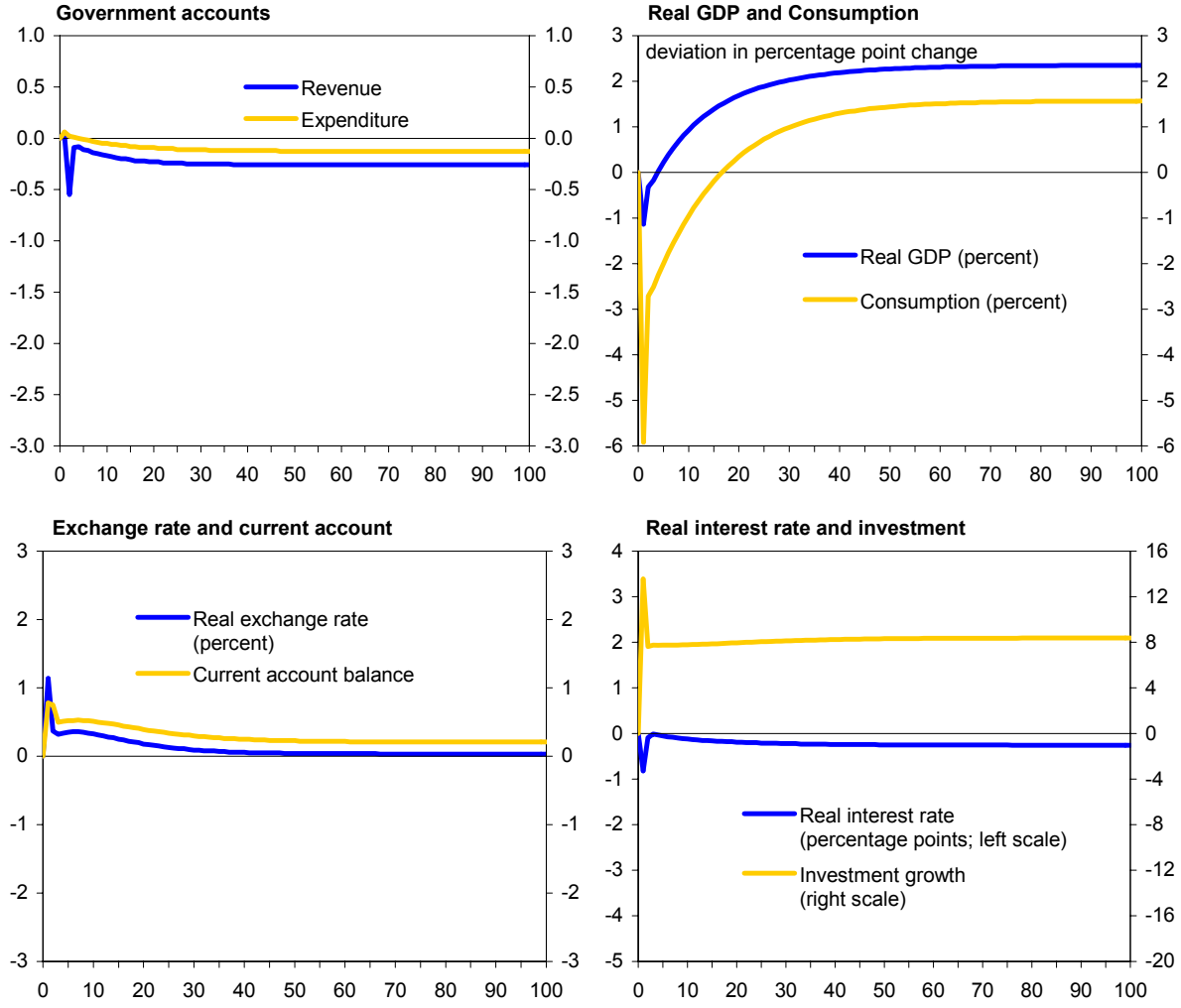
[7] The new view argues that borrowing by debt issuance rather than equity issuance is the main form of financing of investment. Since debt financing is tax deductible, capital income is effectively taxed only once, and hence there is no need to reduce the personal income taxation of capital. This has little impact on the simulations in this paper, which focus on the macroeconomic consequences of reducing the taxation of personal capital income, rather than on the welfare implications of taxation across factors of production.

[8] If tax reform results in a reduction in the taxation of overall savings, instead of capital income only, the benefits are smaller. The reason is that increasing labor income taxes to reduce taxes on interest income increases distortions in the economy.

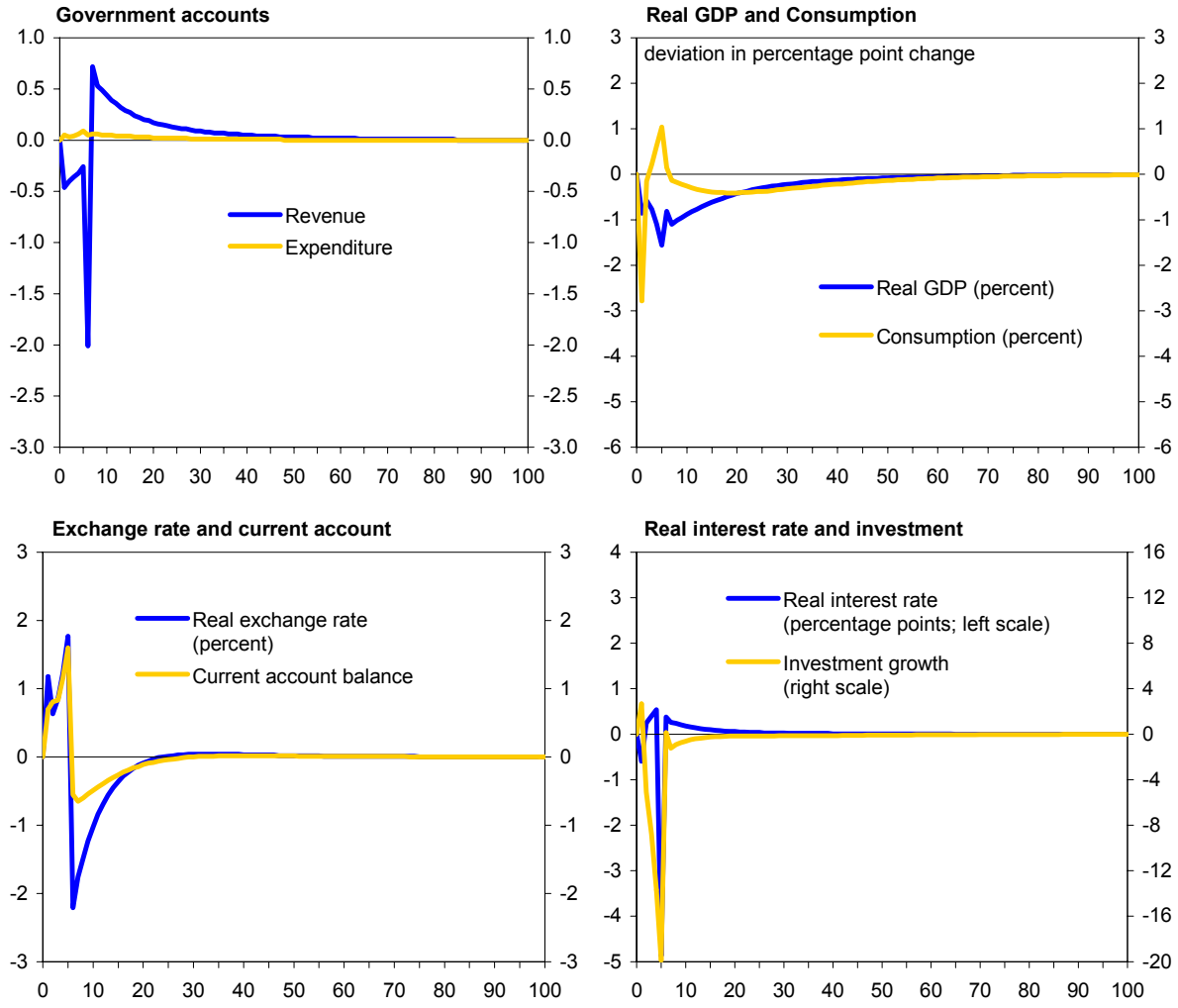
Figure 6. Effects of Revenue Neutral Tax Reform that Lower Personal Taxation of Capital Income
(Deviation from baseline in percent of GDP unless otherwise noted)



Source: IMF staff estimates.

Figure 7. Effects of Non-Revenue Neutral Tax Reforms that Lower Personal Taxation of Capital Income

(Deviation from baseline in percent of GDP unless otherwise noted)



Source: IMF staff estimates.

Table 3. Tax Reform: Impact of Different Parameters on Simulation Results

(long-term effect on GDP (in percent relative to baseline))

Baseline 1/	2.35
Longer planning horizon (q = 0.999)	4.30
Inelastic labor supply (eta = 0.999)	2.67
Lower intertemporal elast. of subst. (rho = 1/4)	2.82
Higher elast. of subst. between cap. and labor (xi = 1.0)	3.65
Introducing rule-of-thumb consumers (ROT = 0.25)	2.57
Lower elasticity of subtitution between home and foreign goods (omega = 1)	2.33

1/ See Figure 6; baseline parameters are: q = 0.90; eta = 0.96; rho = 1/3; xi = 0.8; ROT = 0; omega = 2.5.

VI. EFFECTS OF U.S. FISCAL REFORM ON THE REST OF THE WORLD

Since the U.S. accounts for about one-third of global output, its policies affect the world real interest rate. As a result, social security and tax reform could potentially have large effects on the savings-investment decisions in the RoW. Furthermore, U.S. fiscal policies affect its real exchange rate and therefore implies both expenditure-switching and wealth affects. Finally, insofar U.S. fiscal policies affect the level of aggregate demand, there will be repercussions on the demand for tradeable commodities from its trading partners.

The simulation analysis suggests that introducing PRAs, a social security lockbox, or a successful reduction in corporate taxation in a debt neutral manner has large positive effects on output and consumption in the RoW in the long run (Table 4).[9]

Table 4. Fiscal Reform in the U.S.: Spillover Effects to the Rest of the World
(long-term effect (in percentage points relative to baseline))

	GDP	Consumption	Real interest rate
PRAs with fiscal consolidation 1/			
Labor income taxes	1.99	0.62	-0.52
Personal income taxes	2.11	0.67	-0.55
Corporate income taxes	2.23	0.72	-0.58
Labor income taxes and government spending	2.00	0.63	-0.52
Social security lockbox with fiscal consolidation 2/			
Labor income taxes	1.89	0.59	-0.50
Personal income taxes	2.01	0.63	-0.53
Corporate income taxes	2.12	0.68	-0.55
Labor income taxes and government spending	1.90	0.60	-0.50
Tax reform 3/			
Revenue neutral	1.04	0.36	-0.26
Failed reform	0	0	0

1/ U.S. introduces PRAs, but prevents an increase in government debt by increasing labor, personal, or corporate income taxes, respectively by raising labor income taxes and reducing transfers.
2/ U.S. introduces a social security lockbox, but prevents an increase in government debt by increasing labor, personal, or corporate income taxes, respectively by raising labor income taxes and reducing transfers.
3/ U.S. eliminates double taxation of savings in either a revenue neutral manner, or in a non-revenue neutral way with the reform being reversed after 5 years.

[9] See Kumhof and others (2005), who use a four-country version of GFM, for a more detailed assessment of medium- and long-term effects of fiscal consolidation in the Unites States on the rest-of-the-world. The effects in GFM of fiscal consolidation on the current account and world real interest rates is larger than in for example Erceg and others (2005). The two key reasons for this are: (i) the reforms considered here affect the level of government debt in a permanent manner; and (ii) consumers in GFM are less-Ricardian, since they have a limited planning horizon owing to the overlapping generations structure of the model.

The reforms increase national saving in the United States, resulting in a decline in world real interest rates by about 50 basis points. This result is largely insensitive to the measure through which the reform is achieved. This causes an increase in investment which more than offsets the effect of real exchange rate appreciation in the RoW. Similarly, revenue neutral tax reform, by increasing U.S. saving and consumption, also implies positive output and consumption effects in the RoW.

VII. CONCLUSIONS

Personal retirement accounts (PRAs) are unlikely to yield significant macroeconomic benefits unless lower social security contributions to the government spur additional fiscal consolidation. If the introduction of PRAs is combined with fiscal consolidation to prevent a large increase in government debt, interest rates decline by about 50 basis points in the long run, and output increases to about 3 percentage points above the baseline. Similar benefits are obtained if the social security surplus is placed in a lockbox while maintaining the same debt target.

Lowering the taxation of investment income is beneficial, but only if the reform is revenue neutral. A revenue-neutral personal income tax reform yields a long-run increase in GDP of about 2 percentage points above the baseline. In contrast, a reform that is not revenue neutral and needs to be reversed implies no long-run benefits and entails transition costs over the short to medium run.

Corporate income taxes are more distortionary than labor income taxes, with personal income taxes an intermediate case. As a result, the long-term benefits of introducing PRAs or a social security lockbox—while maintaining the same debt target—are largest if they allow for a future reduction in corporate income taxes. These long-term gains of fiscal consolidation depend particularly on the planning horizon of consumers and, to a lesser extent, the substitutability between capital and labor. It is also observed that if consumers are less sensitive to changes in the real interest rate, fiscal consolidation leads to smaller output losses in the short run but has a larger and earlier expansionary effect over the long term.

By making implicit (future) liabilities explicit, PRAs and a social security lockbox could exert additional fiscal discipline. To the extent that this induces fiscal consolidation in the United States, there would be substantial positive spillovers to the rest of the world, primarily as a result of lower world real interest rates. Similarly, the rest of the world would gain if tax reform in the United States, with the aim of reducing the double taxation of saving, were to be implemented in a revenue-neutral manner.

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