

PASSIVE SAVERS AND FISCAL POLICY EFFECTIVENESS IN JAPAN

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Abstract

The efficacy of fiscal policy in Japan in the last decade has been a subject of considerable dispute, and the coincidence of mounting deficits and continued stagnation has led some to conclude that fiscal policy was ineffective. This paper finds ample support for the opposite conclusion: exogenous fiscal policy shocks (as derived from a structural vector-autoregression model) had pronounced real effects in Japan. Expansionary fiscal policy was expansionary, and contractionary policy contractionary, consistent with the implications of conventional macroeconomic theory. A historical decomposition shows that Japan's burgeoning public debt stems almost entirely from the recession-caused slowdown in revenue growth, and that fiscal policy was at times procyclical rather than consistently expansionary. Direct examination of the long-run relationship between private saving, taxes, and spending confirms that any Ricardian effects of future public liabilities on saving were insufficient to offset the direct first-order effects of taxes and public expenditures. The passivity of Japanese savers therefore seems to have contributed to the efficacy of fiscal policy; otherwise, some combination of increased saving, capital outflow, and higher interest rates would have diminished its impact.

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The effectiveness of fiscal policy in Japan in the 1990s has been at least as controversial as the currently more public disputes over monetary policy. There has been open debate over the degree to which expansionary fiscal policy has even been tried, let alone whether it has been effective, along with widespread assertions about the degree of forward-looking behavior by Japanese savers. The highly visible and rapid more-than-doubling of Japanese public debt in less than a decade speaks for itself to a surprising number of observers: the fiscal deficit has grown sharply, yet the economy has continued to stagnate, so fiscal stabilization failed. No less an economist than Milton Friedman recently wrote, “[D]oes fiscal stimulus stimulate? Japan’s experience in the ’90s is dramatic evidence to the contrary. Japan resorted repeatedly to large doses of fiscal stimulus in the form of extra government spending. . . . The result: stagnation at best, depression at worst, for most of the past decade.”¹

But it is easy to demonstrate from just charting publicly available data that the bulk of the increase in Japanese public debt is due to a plateau in tax revenue rather than to increased public expenditure or even discretionary tax cuts. This of course reflects the inverse cyclical relationship between output and tax revenue. If one applied a plausible tax elasticity of 1.25 to reasonable measures of the widening output gap (e.g., those estimated in Kuttner and Posen 2001), the result would be a much-reduced estimate of the structural budget deficit. In fact, using the measure of potential based on a constant productivity trend growth rate of 2.5 percent a year all but eliminates the nonsocial security portion of the deficit. Moreover, as measured by the fiscal shocks derived from our estimates in this paper, fiscal policy has been generally contractionary since 1997.

More tellingly, the massive increase in Japanese government debt outstanding over the period has had little apparent effect to date on either the level of long-term interest rates or the steepness of the yield curve, or the yen-dollar exchange rate. This is commonly attributed to the passivity of Japanese savers, and there surely has been no sign of crowding out or of inflation fears. This fact has not gone unremarked upon in the financial press.² As this paper is being written, Moody’s has just announced that Japanese (domestically denominated) sovereign debt “is almost certain to be downgraded...[perhaps] a threatened

¹Friedman, “No More Economic Stimulus Needed,” *Wall Street Journal*, October 10, 2001, A17. See also Ian Campbell, “Friedman Opposes Stimulus Package,” *UPI Newswire*, October 9, 2001.

²*The Economist* observed, “[government bond yields] fell as the government pumped the economy with . . . fiscal stimulus, as the yen plummeted by 40 percent from its high in the middle of 1995, and even as the government’s debt climbed to 100 percent of GDP. By late [1997] the Japanese government was able to borrow more cheaply than any other government in recorded history,” “Japanese Bonds: That Sinking Feeling,” *The Economist*, February 21, 1998, 74-75.

two notches to A2,” below the credit rating of Botswana³. But with the exception of a brief panic-induced spike in rates in January 1999, more than half of which was reversed within two months, holders of Japanese government bonds have yet to take any significant capital losses.

Against this background of declining tax revenues and relatively stable long-term nominal interest rates, the actual course of Japanese fiscal policy has been almost tumultuous, rather than one of unremitting spend-spend-spend, as often assumed. The divergence of common perceptions from reality may be due in part to the fact that Japan has a centralized, if arcane, fiscal system.⁴ Every year since 1994 has brought announcements of various tax reforms, but their actual impact is difficult to ascertain.⁵ On the public spending side, estimating the *mamizu* (“true water”) of any Japanese fiscal stimulus requires great care, given institutional complications.⁶ Meanwhile, in terms of revenue collection, the Japanese tax base is rather small by developed economy standards, especially on the household side, where salaried urban workers pay a disproportionate share of the taxes, and small business owners and rural residents pay almost none.⁷

The absence of obvious interest rate, inflation, or crowding-out effects from the fiscal measures undertaken leads us to examine what really happened with fiscal policy in Japan in the 1990s. If standard Mundell-Fleming theory tells us that an open economy engaged in expansionary fiscal policy drives up interest rates, limiting that policy’s effectiveness, then perhaps the absence of an interest rate rise is indicative of the opposite. Our first consideration therefore is simply whether the fiscal impulses had Keynesian counter-cyclical signs, and what impact those impulses had. As many observers have stressed, traditional public works in Japan more closely approximate the building of pyramids in hinterlands, famous to macroeconomics undergraduates, than do those in any other OECD country.⁸ Some have indicated that they would expect the multiplier on such wasteful expenditures to be less than one.⁹ Of course, although

³ David Pilling, “Japan braced for a rating downgrade as economy dips,” *Financial Times*, March 9, 2002, 4.

⁴See Ishi (2000) for a historical perspective; Balassa and Noland (1988), Bayoumi (1998), and *OECD Economic Survey: Japan* (1999), for institutional descriptions; and Schick (1996) for a comparison of US and Japanese budget processes. Tax Bureau (2000) gives the official account of the tax system.

⁵See Watanabe, Watanabe, and Watanabe (2001) and Tax Bureau (2000).

⁶ See Posen (1998).

⁷See Balassa and Noland (1988).

⁸Sixty percent of the Japanese coastline is today reportedly encased in concrete (Ian Buruma, “The Japanese Malaise,” *New York Review of Books*, July 5, 2001, 5). Similar examples are easy to come by: see, for example, Martin Wolf, “Japan’s Economic Black Holes,” *Financial Times*, January 17, 2001, 21, and Bergsten, Ito, and Noland (2001, 64-65).

⁹In June 1998 the then-Vice Minister of Finance for International Affairs Eisuke Sakakibara (1999, 45), expressed a contrary point of view: “Concerning the current fiscal package, I know that there have been various criticisms of it, but I think there is now a wider acceptance, even in the international community, of public works as a more effective means than tax cuts. In addition, under current circumstances, a strong multiplier effect can be expected....”

Keynes maintained that even overtly wasteful public works projects were an effective source of fiscal expansion, several observers have stressed that in the Japanese context tax cuts are likely to be more effective.

We then turn to historical decompositions of the effect of fiscal policy on the Japanese economy in the 1990s. The ample variation in Japanese fiscal policy, moving from contractionary to expansionary and back to contractionary, with some tax measures, temporary and others permanent, provides a rich basis for econometric investigation. Upon that investigation, it becomes clear that fiscal policy provides an apparent explanation for a surprisingly large amount of the variation in Japanese economic growth over the period. Meanwhile, on the tax side, all tax cuts were preceded and accompanied by loud declarations by government officials that eventually taxes would have to go up—whether due to the looming demographic threat, the unsustainability of Japanese public debt, or the supposedly declining potential growth rate. Even though we find that these well-publicized dangers from debt did not have any obvious short-run effect on multipliers, we also directly examine the possibility of Ricardian equivalence. Finally, we conclude by considering some of the questions raised by the apparent fiscal power granted through savers' passivity in Japan.

I. THE SHORT-RUN EFFECTS OF FISCAL POLICY

To assess the impact of fiscal policy on the economy, we employ a structural three-variable vector-autoregression (VAR) model adapted from the work of Olivier Blanchard and Roberto Perotti.¹⁰ Their approach is designed to identify the impact of fiscal policy while allowing for contemporaneous interdependence among output, taxes, and spending. The one-lag version of the Blanchard-Perotti model can be expressed succinctly as

$$(1) \quad A_0 Y_t = A_1 Y_{t-1} + B \varepsilon_t,$$

where $Y_t = (T_t, E_t, X_t)'$ is the vector of the logarithms of real tax revenue, real expenditure, and real GDP, and ε_t is interpreted as a vector of mutually orthogonal “shocks” to the three jointly endogenous variables.

Following Blanchard and Perotti, real GDP is allowed to have a contemporaneous effect on tax receipts, but not on expenditure. Taxes do not depend contemporaneously on expenditure, or vice versa, although tax “shocks” are allowed to affect spending within the year. This assumption conforms to the

¹⁰Blanchard and Perotti (1999). Kuttner and Posen (2001) first applied this approach to Japanese data, in a more limited manner, without computing standard errors and confidence intervals.

institutional setup for fiscal policy in Japan, where taxes are mostly collected from withholding and consumption, spending mostly is implemented with a lag, and both automatic stabilizers and the size of the public sector are limited.¹¹ With these assumptions imposed, the model can be written as

$$(2) \quad \begin{aligned} T_t &= a_0^{l3} X_t + a_1^{l1} T_{t-1} + a_1^{l2} E_{t-1} + a_1^{l3} X_{t-1} + \mathbf{e}_t^T \\ E_t &= a_1^{21} T_{t-1} + a_1^{22} E_{t-1} + a_1^{23} X_{t-1} + b^{21} \mathbf{e}_t^T + \mathbf{e}_t^E \\ X_t &= a_0^{31} T_t + a_0^{32} E_t + a_1^{31} T_{t-1} + a_1^{32} E_{t-1} + a_1^{33} X_{t-1} + \mathbf{e}_t^X \end{aligned}$$

where a_l^{ij} and b^{ij} represent the i,j th elements of the \mathbf{A}_l and \mathbf{B} matrices. Thus a_0^{l3} captures the within-period elasticity of tax receipts with respect to GDP, b^{21} is the effect of tax shocks on expenditure, and a_0^{31} and a_0^{32} allow taxes and expenditure to affect real GDP contemporaneously.

The model in equation 2 is not identified, however, with seven parameters to estimate from the six unique elements of the covariance matrix of reduced-form VAR residuals.¹² Our strategy, like that of Blanchard and Perotti, is to bring to bear independent information on the elasticity of tax revenue with respect to changes in real GDP, that is, the value of a_0^{l3} . Specifically, we draw on the work of Claude Giorno et al. (1995) and use a value of a_0^{l3} equal to 1.25.¹³ With that parameter fixed a priori, the model is exactly identified.

Reliable comprehensive quarterly fiscal data for Japan are not available, unfortunately, and so we fit the model instead to annual consolidated central, state, and local fiscal data, compiled by the IMF, spanning fiscal years 1976 through 1999. The model also includes a linear trend and a trend interacted with a post-1990 dummy.¹⁴ Tax receipts are defined as direct and indirect tax revenue, excluding social security contributions. Expenditure corresponds to the sum of current and capital expenditure, less social security and interest payments.¹⁵

¹¹It is also possible to identify the model under the assumption that spending shocks affect tax revenue contemporaneously. The results under this alternative assumption are virtually identical to those reported below.

¹²For a complete discussion of the identification and estimation of structural VARs, see Hamilton (1994, chapter 11).

¹³Giorno et al. (1995). Similar results are obtained under a range of plausible alternative assumptions about the value of a_0^{l3} (available from the authors upon request). It would be possible to extend the work of Giorno et al. to construct a time-varying elasticity that reflects the changing structure of the tax system, but because the results prove insensitive to the choice of a_0^{l3} , this would be little more than an embellishment.

¹⁴The model makes no explicit distinction between temporary and permanent tax and expenditure changes, in part because the temporary tax changes enacted in Japan have been much smaller in magnitude than the permanent ones (see Watanabe, Watanabe, and Watanabe, 2001). Many of the supposedly permanent tax changes were offset by subsequent tax legislation, however, and this pattern should be picked up by the model's dynamics.

¹⁵As noted by Blanchard and Perotti (1999), estimating the third equation in the structural VAR is equivalent to using a measure of "cyclically adjusted" tax receipts (and a similarly adjusted measure of spending) as instruments for taxes and spending in a two-stage least squares regression.

Figure 1 plots the estimated impulse response functions. These multiyear effects are the relevant ones for policy analysis. Comparing the left two boxes in the last row of figure 1 shows that both tax cuts and expenditure increases have expansionary effects. The effect of the tax cut on GDP falls outside the 90 percent confidence interval for at least three years, while the effect of the spending shock is significantly different from zero for two years. The effects are no more comparable in magnitude than in duration: the point estimate of the effect of a tax shock on GDP is at or above the upper confidence band on the effect of a spending shock on GDP. Notwithstanding the characterization of most Japanese tax law changes as permanent in intent, shocks to tax revenue tend to be relatively transitory, essentially disappearing after one year.¹⁶ In contrast, public works spending shocks are highly persistent, in keeping with institutional and journalistic accounts of government behavior in Japan (and elsewhere), as can be seen in the second box of the first row of figure 1.

The dynamic effects of tax and spending shocks, including the expansionary effect of tax cuts on GDP, is easier to interpret (and more dramatic) when put in yen terms, as is done in table 1. To do so requires scaling up the response by the inverse of the share of taxes in GDP, which averaged 19 percent during the 1990s. Making this adjustment results in a cumulative ¥484 increase in GDP in response to a ¥100 tax cut. One explanation for the size of the response is that, over the sample period, tax cuts have tended to be associated with spending increases; in fact, the cumulative increase in spending is roughly equal to the fall in taxes.¹⁷ Overall, GDP rises by more than twice the sum of the spending and tax effects.

The immediate impact of a 10 percent positive spending shock on GDP is 1.6 percent, however, which translates into ¥84 for a ¥100 spending increase, and the stimulus builds only slightly over time. One reason for the smaller estimated effect of spending than of tax shocks is that taxes tend to *rise* in response to positive spending shocks in this sample, partly offsetting the expansionary impact of the spending increase. This can be interpreted as evidence of the expensive maintenance of unproductive Japanese public works projects. Overall, the increase in GDP is about 1.75 times the net effect of the spending minus the tax increases—smaller than the effect of tax shocks, but still a respectable economic impact.

These results show that, when it has been used, discretionary fiscal policy in Japan has in fact had the effects predicted in standard *closed-economy* macroeconomic analyses. Both tax cuts and spending increases lead to higher real GDP, although the tendency for taxes and spending to move together has

¹⁶ As documented by Watanabe, Watanabe, and Watanabe (2001). Because of the feedback between taxes revenues and GDP, and the greater-than-unit elasticity of tax revenue with respect to GDP, the impact of a 10 percent tax shock on tax revenue is slightly less than 10 percent.

¹⁷ Blanchard and Perotti (1999) found a qualitatively similar pattern in the US data.

reduced the impact of spending increases.¹⁸ The commonly held perception of fiscal policy's ineffectiveness in all likelihood stems from a failure to recognize the dependence of tax receipts with respect to GDP: as GDP falls, tax revenue shrinks, but to conclude from this that changes in the deficit have not affected growth would be incorrect.

II. MULTIPLIERS ON TAX CUTS AND PUBLIC SPENDING

The difficulty in reading off a simple multiplier from our estimations is that in the data (and therefore in Japanese reality over the period) tax cuts generally have been accompanied by spending increases; expenditure increases, on the other hand, have generally been accompanied by tax increases. So, for example, in table 2, where we list the ¥484 estimate of the effect on GDP of a ¥100 tax cut, we are actually reporting the four-year cumulative effect of the tax cut *and* of the accompanying expenditure increase seen in the data.

A fair comparison of the effects of (or multiplier on) tax cuts and expenditure increases therefore requires some calculation. We do this by examining the response to a *linear combination* of tax and spending shocks calculated to generate a 1 percent impulse to the variable of interest, and a zero response (averaged over four years) to the other variable. The response of GDP to this combination of shocks is then used to calculate a “pure” multiplier on tax or spending shocks. For example, a -0.66 percent (expansionary) tax shock combined with a -0.21 percent (contractionary) spending shock gives a 1 percent reduction in tax revenues over four years, with no cumulative on spending, and a net 0.47 percent increase in real GDP.

Scaling this response by the inverse of the share of taxes in GDP (using the 1990-99 average of 19 percent) yields a multiplier for tax cuts of 2.5; a similar calculation for spending increases gives a multiplier of 2.0. As a result of this difference in magnitudes, the cumulative four-year gain to Japanese GDP from a revenue neutral shift of ¥100 from public works spending to tax cuts is ¥47. These estimates also understate the beneficial effects of tax cuts, because they do not directly capture the allocative efficiency gains from changes in the Japanese tax code, just the immediate macroeconomic impact. Though such gains can be exaggerated, there is good reason to believe that such supply-side effects would be large in Japan today.

¹⁸Further work is needed to reconcile our results on the sizable effects of fiscal policy in Japan with the findings (using much different econometric approaches) of Bayoumi (2001) and Perri (1999) that fiscal policy had the expected sign but very small effects, and of Ramaswamy and Rendu (2000) that “public consumption had a dampening impact on activity in the 1990s.” It is our initial evaluation that these other analyses did not take full account of the dynamic interactions among GDP, tax revenue, and expenditure in the way that we were able to.

These effects at first glance may seem rather large, relative to other published estimates; in fact they are quite close to comparably calculated multipliers for the United States, such as those Blanchard and Perotti (1999). The “multipliers” reported there, however, are defined differently from those we calculate. Blanchard and Perotti reported multipliers defined as the ratio of the *peak* response of GDP to the *initial* impact on taxes or spending. That method can be misleading, however, as it inadequately takes into account the dynamics of the response. (For example, their method would yield a nonzero multiplier even if the impact on GDP were subsequently reversed.) Using our method to calculate comparable multipliers from Blanchard and Perotti’s trend-stationary estimates, one obtains a multiplier of roughly 4.0 for tax shocks—considerably larger than our estimate for Japan. Our estimated spending multiplier for Japan is somewhat higher than the comparable multiplier for the United States calculated from the Blanchard-Perotti results, but quite close to similar calculations based on their estimated response to military spending shocks.

One factor affecting the size of our estimated multipliers is the omission of monetary policy. It would, of course, be good to have a model that included monetary policy explicitly, but the annual frequency of analysis (forced upon us by limitations of Japanese fiscal data) renders untenable the conventional VAR identifying assumption that monetary policy does not affect the economy contemporaneously.¹⁹ Still, even though monetary policy does not enter our structural VAR explicitly, it does implicitly, in the sense that the estimated response to tax and spending shocks includes any accommodation of those shocks by the central bank. In that sense, the estimated multipliers do not correspond to the standard textbook IS/LM multipliers, where the LM-curve remains fixed when the IS-curve shifts. Instead, our multipliers represent the effect of the fiscal policy induced IS-curve shift, plus any tendency for the monetary authority to shift the LM curve in response. So although the omission of a monetary variable does not, strictly speaking, does not bias our results one way or the other, its absence means that we are unable to compare our estimate with the Japanese economy’s response under the counterfactual of “no monetary accommodation.” It is unclear, however, how much the last several years’ monetary-fiscal policy mix differs from that situation in practice.

III. HISTORICAL DECOMPOSITIONS OF THE EFFECTS OF FISCAL POLICY

Despite the institutional complications mentioned above, one can give a fair picture of the timeline of

¹⁹ Including simply money, rather than a representation of monetary policy (presumably in terms of effects on credit conditions), would be unlikely to have any effect on our estimates except to add a noisy regressor, since the link between money growth and real outcomes has been weak to nonexistent (Kuttner and Posen 2001).

Japanese fiscal policy since the bubble burst in 1990.²⁰ The purpose of this section is to link those policy developments with the tax and spending shocks estimated in our VAR, and then with their cumulative impact on GDP over time. These are reported in the bar charts of figures 2 and 3 respectively. In both charts, the light grey bars depict the tax shocks (defined so that positive values are stimulative, i.e., tax *cuts*) and the dark grey bars correspond to spending shocks (positive values are spending increases). Figure 2 plots the shocks themselves; the scale represents the percentage deviation from the tax revenues or expenditures that would have been predicted, given the lags and deterministic trends in the model. Figure 3 shows the contribution of those shocks, to real GDP growth, expressed as the annualized percent change.

Following the asset price collapses of 1990-1992, the Japanese government introduced the first of a series of stimulus packages of public works in August 1992 and April 1993, but the net incremental expenditure was small: 2 percent of GDP in total, versus an announced combined size of 5 percent of GDP. As seen in figure 2, however, these were quite stimulative, with the spending accumulating over the two years. The Diet passed a special income tax reduction in November 1994, to take effect in fiscal year 1995, amounting to 0.6 percent of GDP, but as seen in Figure 2, the effects were felt already in 1994.²¹ Interestingly, this tax cut was accompanied by an almost offsetting spending cut. The effects on GDP growth of this sequence were as to be expected, as shown in figure 3: the tax cuts were felt particularly in 1993 and 1995, but with little persistent effect, while the effects of the spending cut in 1994 was more than enough to offset the tax cut of that year. In 1995, the Japanese government implemented its first relatively large scale tax cut/public spending combination, which had a double-barreled impact on GDP that year; the greater multiplier on tax cuts, however, can be seen in the over 1.0 percent effect on GDP from the tax shock, despite that shock being smaller than spending in impulse.

As is now well-known, from the time of its passage, the 1995 tax cut was supposed to be reversed at the start of fiscal year 1997, and that tax increase was to be accompanied then by an increase in the national consumption tax (a value-added tax) from 3 percent to 5 percent. At the time, Prime Minister Tomiichi Murayama and senior budget officials cited concern about the looming demographic threat as the primary reason for the tax consolidation and the shift to indirect taxes. Some belief in the power of an expansionary consolidation, due to Japan's debt situation, was also invoked as a reason for the planned tax

²⁰Posen (1998, chapter 2); *OECD Economic Survey: Japan*, 2000; IMF (2000); and Bergsten, Ito, and Noland (2001) give more detailed accounts of the policies undertaken over this period. Asako, Ito, and Sakamoto (1991) provide an excellent account of "the rise and fall of [the] deficit in Japan, 1965-90."

²¹The Japanese government fiscal year runs from April 1 to March 31.

increase.²² In June 1996 the Tax Commission (an advisory body to the prime minister) and then the Diet reaffirmed the commitment to the tax increase. In April 1997 contribution rates to social security were increased along with the repeal of the temporary income tax cut and the implementation of the consumption tax increase. The tax burden rose by nearly 2 percent of GDP, more *mamizu* than any of the fiscal stimulus packages implemented up to that time.

These measures would have been thought to have had two competing effects: a Ricardian effect of increasing savings offsetting a clearly temporary tax cut whose very reason for temporariness was the imminent budget crisis; and an intertemporal substitution effect, with households seeking to make purchases before the tax increase took effect. Both of these forward-looking effects cannot be measured directly in our VAR by the fiscal components, so we estimate a dummy variable for the year 1996, where a positive effect on GDP would indicate a pre-dominance of the intertemporal substitution effect.²³ We find that the impact of the 1996 dummy on GDP is about 3 percent, significant at the 10 percent level. This impact should not be entirely attributed to such effects, however, as the dummy also picks up the cumulative effect of past fiscal measures as well as any other factors idiosyncratic to 1996 (like the last year of Asian economic expansion). This can be seen in figure 3 where there is a sizable combined tax and spending impact on GDP, but nothing like 3 percent. Still, it is clear that despite the announcements and warnings accompanying the tax cut, Japanese consumers in 1995-96 did respond to a tax cut with expanded demand.

A recession and a series of financial failures hit Japan in the months following the April 1997 tax increase. The contractionary fiscal impulse and its extremely sizable effect on GDP are strikingly obvious in figures 2 and 3.²⁴ In response to these events, as well as to international pressures stemming from the Asian financial crisis and an electoral setback for the Liberal Democratic Party in July 1998, apparently large stimulus packages were announced in both April and November. These included front-loaded public works to make up for the falloff in public spending in the second half of 1998 (and merely creating another such shortfall in the second half of 1999), as well as a combination of permanent income tax rate cuts,

²²See David Holley, "Japan Approves a Tax Cut Plan; U.S. Lukewarm," *Los Angeles Times*, November 26, 1994, D1; "Editorial: Drastic Reforms Must Be Carried out," *Daily Yomiuri*, June 21, 1996, 13; William Dawkins, "Japan Confirms Sales Tax Increase," *Financial Times*, June 26, 1996, 6; and the account in Posen (1998, 50).

²³Again, limitations of Japanese government revenue data availability force us to annual data rather than trying to key to the specific months of the fiscal year or of the time of announcement.

²⁴Because the fiscal impulses are measured relative to long-term trends, the dummied-out of 1996 fiscal policy is not a source of exaggeration of these within 1997 effects. While some might argue that the 1997 contraction was in part due to the financial problems of fall 1997, particularly the surprise closure of Hokkaido Takusyoku Bank, it is difficult to find direct evidence of this in the data. Hori and Takahashi (2001) establish that the effects of that bank closure on client firms were minimal. In any event, with the bank closure coming in November, the timing would be suspect.

primarily for corporations and the top personal income tax bracket. According to the IMF, these initiatives contained 4 percent of GDP in “real water” measures.²⁵ It is clear from figure 2, however, that after the cumulative effect of previous spending cuts were taken into account, the 1998 stimulus package was smaller than that of 1995, and once the lingering tax effects were put in, the net impact on the economy of this policy combination was nearly zero. More important, the cumulative impact of 1997’s fiscal contraction persisted through 1998 and into 1999, taking away an additional more than 2.5 percent of GDP growth. There was no expansionary impact of this contraction through confidence or any other channel.

IV. TAXES, PUBLIC EXPENDITURE, AND SAVINGS IN THE LONG RUN

On many *a priori* criteria—the connections of households across generations, the rapid aging of the Japanese population, and the repeated public statements by officials and commentators about future budget difficulties, not to mention the obvious rapid rise in public debt—it would appear that if forward-looking savers were to offset fiscal expansion anywhere, and to respond to fiscal contraction with increased confidence, it would be in Japan in the 1990s. In the words of Allan Meltzer (1998), “There is no way to finance these present and future [government] liabilities that will not involve higher future tax rates. The US Treasury may not understand it, but the ordinary Japanese citizen has been told the truth about this problem for years.” In one of his last public speeches to the Diet, on March 8, 2001, then-Finance Minister Kiichi Miyazawa announced that Japan’s finances “are very close to collapsing. We need fundamental fiscal restructuring aimed at rebuilding our finances in the 21st century, looking 10, 20 years into the future.”²⁶ Asher (2000) asserts, “Overall, consumption in Japan is ‘rationally suppressed’ by structural factors outside of the range of monetary policy influence. . . . Moreover, with public anxiety over the ballooning government debt growing it seems that this is generating a fair degree of Ricardian ‘precautionary saving.’”

Such fears would have a surface plausibility, given reasonable concern for oncoming demographic shifts as well as the apparent decline in the government’s fiscal position. It is well documented that, on current trends, Japan faces a greater demographic challenge from its aging work force and increasing social security burden than any other developed economy. Andrew Smithers (1999) adds to the picture evidence of widespread weakness of local government balance sheets. Asher and Smithers (1998) point out that the government of Japan is potentially liable not only for local and central government debt, but

²⁵“The implementation of these packages was mostly felt in calendar 1999, however, due to the 3-6 month gestation period for public works projects, and owing to the fact that most of the tax measures were implemented through the FY1999 initial budget.” IMF (2000, 29).

²⁶“Japanese Finance Minister Says Nation’s Finances ‘Near Collapse,’” Associated Press Newswires, March 8, 2001.

also for the liabilities of the Trust Fund Bureau (to postal savings account holders) and of the state pension scheme. As early as 1998, the OECD concluded that the rate of increase in net Japanese government debt (that is, debt outstanding after accounting for public assets and government holdings of its own bonds) “must soon be brought down for the dynamics of the debt not to become explosive, even if the pensions’ problem is separately resolved.”²⁷ Simulations based on demographic projections by IMF economists Hamid Faruquee and Martin Mühleisen (2001) yield daunting estimates of the policy changes and trade-offs that need to be addressed if Japan is to restore fiscal sustainability.

Yet, perhaps because it seems so self-evidently logical, the actual extent of the Ricardian offset to fiscal expansion in Japan has not been assessed. The apparent Keynesian response of GDP to fiscal policy documented in the last two sections, however, would seem to be *prima facie* evidence that large Ricardian effects were not present. We look for Ricardian effects directly through an adaptation of the saving regressions used by Michael Hutchison (1992). A key benefit of this approach is that it allows us to break out the differential effects on saving behavior of taxes, transfers, and public spending; these effects may indeed differ, especially in the Japanese context. The regression results are based on the equation

$$(3) \quad S_t = \alpha + D_t\beta + \mathbf{x}'_t\mathbf{g} + e_t,$$

where S is saving measured as a percentage of GNP, net of taxes, plus social security payments; D is a demographic variable (the old-age dependency ratio); and \mathbf{x} is a vector of fiscal variables, each expressed as a percentage of GDP.²⁸ Since S , as well as many of the regressors, appears to be difference stationary, this regression can be interpreted as a long-run cointegration relationship; as such, it abstracts from the dynamics of the relationships between fiscal policy and the rest of economy, which are modeled more explicitly in the framework used in section 2 above.²⁹ Accordingly, Phillips-Ouliaris statistics are reported for the test of the null hypothesis that the residuals from the estimated regression are nonstationary (that is, that there is no cointegration).

Following Hutchison, we start with the simplest measure of fiscal policy—the overall fiscal balance, or government net lending—and proceed from there to disaggregate that balance into its components. Table 2 displays the results. The simplest regression, containing only the old-age dependency

²⁷*OECD Economic Survey: Japan*, 1998, 85.

²⁸Following Hutchison (1992), we also tried including real GNP growth but found it to have no significant effect on saving. This is a logical result: because real GNP growth is stationary, it should have no long-run impact on saving.

²⁹As in the earlier analysis, the lack of comprehensive quarterly fiscal data forces us to use annual data, but since the relationship focuses exclusively on the long run, this is not a major handicap.

ratio and the fiscal balance, reported in column 1, displays a positive coefficient on the old-age dependency variable. This is inconsistent with the usual life-cycle interpretation, in which old people are dissavers, and suggests that this hypothesis does not adequately capture the behavior of Japanese elderly.³⁰ The estimated coefficient on the balance is significant but quantitatively small: it implies that a 10 percent increase in the overall budget deficit is associated with a 1.2 percent fall in private saving over the long-run. Adjusting for the dependent variable's smaller denominator (income net of taxes plus social security payments is 79 percent of GDP over the 1990s), the effect in terms of yen is smaller still: only 0.9 percent of GDP for a 10 percent increase in the deficit. The Phillips-Ouliaris statistic of -5.23 is

sufficient to reject the null hypothesis of no cointegration among the three variables at the 1 percent level.

Column 2 replaces the overall fiscal balance with the two measures of spending and tax revenue used for the structural VAR in section 1: net interest expenditure and social security payments, and revenue excluding social security contributions. The coefficient of -0.31 on the tax revenue variable is significant and suggests a somewhat larger, but still modest, degree of saving offset. (The coefficient on expenditure has the "wrong" sign but is statistically insignificant.) Adjusting for the relative sizes of the variables' denominators, the revenue coefficient implies a ¥24 increase in saving in response to a ¥100 tax cut over the long run. (Given the de facto transitory nature of tax changes in Japan, some saving offset is to be expected, concerns about demographics and future obligations aside.) There is some apparent tension between this long-run response and the short-run multiplier on tax cuts estimated in the previous analysis, but this should not be overdrawn. In essence, the results in table 1 are net of these offsetting saving effects to the degree they are incurred within the three-year horizon.

The final specification, in column 3, adds to the previous specification the two remaining elements in the overall fiscal balance: the social security balance and net interest expenditure. Collectively, these four variables make up the overall fiscal balance (except for a very small "other revenue" category, which is omitted). Neither the social security balance nor net interest seems to bear a systematic relation to saving in Japan over the period: both are insignificant, and together they increase the adjusted R^2 only marginally.

One potential lacuna in this analysis is the failure to incorporate off-budget liabilities, such as

³⁰Using microlevel data, Horioka (1990, 1991, 1993, 1995, 1997), Horioka and Watanabe (1997), and Horioka and others (1996) come up with results more supportive of the life-cycle hypothesis, although the later studies give a more mixed picture than those at the start of the 1990s. This may indicate rising precautionary saving motives as the Great Recession dragged on and the prospect of unemployment or lost pensions rose.

pension shortfalls, debts of semipublic institutions, and likely insurance company failures.³¹ These are omitted largely for lack of dependable time-series data. Still, since these liabilities and their implications for future tax liabilities are even more opaque than on-budget taxes and expenditure, evidence of a large Ricardian offset in the last decade from these sources seems unlikely, given that the more obvious factors had only a small impact on saving. Should these contingent liabilities become overt on the Japanese government's balance sheet, say through the failure of a major life insurer or bankruptcy of a local government, that situation could change a great deal very quickly. In the data to date, however, our results provide little support for the Ricardian equivalence hypothesis under perhaps the most propitious conditions ever seen for it to hold: a rapid and large increase in public debt contemporaneous with a

widely publicized projection of demographic dangers to social security benefits, in an economy already prone to high rates of saving.

V. DYSFUNCTIONAL SAVERS AND FUNCTIONAL FISCAL POLICY

Our examination of the effects of fiscal policy in Japan in the 1990s has taken us on what seems to be a tour of macroeconomics' past: when economies were closed, savers were myopic, and consequently fiscal stabilization was effective. Thus, Japan's experience would appear to offer evidence that one can join Laurence Ball and Gregory Mankiw (1995), and Willem Buiter and Kenneth Kletzer (1992), in asking, "Who's afraid of the public debt?," at least in the short-term. If this is indeed the case, the short term can be separated from the long term: responsible stabilization policy today to maximize growth today is not harmful and indeed is perhaps the optimal response to long-run sustainability issues³².

Alternatively, given the dependence of tax revenues upon economic growth, restrictions on expenditure or even tax increases could backfire. On our estimates, were the Japanese government to maintain a limit on debt issuance in the face of a growth shortfall, the fiscal contraction necessary to maintain a steady budget deficit would have a sizable negative impact on growth, and therefore on fiscal position. As a numerical example, we considered the case where there was a shock of -1.5 percent to GDP, meant to capture the larger end of differences seen between official Japanese government growth

³¹See Asher and Smithers (1998) and Asher and Dugger (2000) for lengthy descriptions of these mounting contingent claims on the Japanese government, as well as Kotlikoff and Leibfritz (1998) for a generational accounting assessment of Japan's demographic imbalances.

³²Interestingly, Thomas Byrne, the senior credit officer at Moody's credit rating agency responsible for Japan, recently advised the Japanese government in a manner consistent with this analysis (rather than demanding immediate contraction): "Japan can't consolidate its way out of this [debt problem], it has to grow its way out...A fiscal policy that didn't include a lot of wasteful spending may present near-term anxiety but, if it really did stimulate

forecasts and actual growth outcomes. In such a case, the direct four-year cumulative effect on GDP in our model is -2.3 percent. This leads to a within year decline of 1.3 percent of total tax revenues, which expands the budget deficit by roughly 0.3 percent of GDP. Using our multipliers, if taxes were raised to make up the revenue shortfall, GDP would decline an additional 0.9 percent cumulative over four years; if public works were cut to make up the revenue shortfall (and maintain level debt issuance), GDP would decline an additional 0.7 percent cumulative over four years.

Yet this is a very discomfoting place to end up as economists even if it might be pleasing to policymakers. We are all familiar with the real-world example of Mundell-Fleming in France in 1980-81, where Francois Mitterrand tried “socialism in one country” with fiscal expansion that was almost completely reversed by rising interest rates, an appreciation of the Franc, and capital inflows. Of course, France was and is more globally integrated than Japan, but it is not as though French households circa 1981 were significantly more likely to move their savings abroad than Japanese households circa 1999—and certainly from the point of view of regulatory and product options, if not mores, Japanese savers today have an easier time of moving money than their French counterparts of twenty years earlier did. In addition, French savers then had far less prospect than Japanese savers do now that their government might be forced to renege upon social security commitments or to confiscate savings in some manner.

Currently, the around \$10 trillion in Japanese national private savings (as compared to a \$4.5 trillion GDP) reside almost solely domestically—and almost 50 percent of that total is kept in savings accounts of one form or another. These accounts earn well under 1 percent interest annually; when the much higher yielding \$1.5 trillion in CD-equivalents in the Postal Savings system came due in 2000–01, most of them were rolled over into similarly low yielding accounts there rather than sent out to pursue new higher-yielding investment opportunities. Merrill Lynch and Charles Schwab are currently shrinking their Japanese consumer operations, which were built on the expectation that some of this rollover money would roll their way, only to be disappointed. Clearly there is an absence of intermediation or at least of arbitrage taking place of the pool of Japanese savings. Meanwhile, there are now over \$6.5 trillion in JGBs outstanding versus under \$3 trillion a decade ago, and real interest rates are around only 100 basis points higher on JGBs on average. So captive savings do translate into fiscal power.

The institutional and cultural factors explaining such vast and costly risk aversion and home bias are beyond the scope of this paper, but it is interesting to contemplate the macroeconomic consequences of this apparent bias, or of its disappearance. To understand these consequences, consider the thought experiment in which one morning a significant fraction (say 20 percent) of bank savings account holders in

growth, it would be good over the long term.” Quoted in Pilling, “Japan braced for a rating downgrade,” op cit.

Japan woke up and decided to reallocate their portfolios towards higher-yielding assets. With no domestic assets paying an attractive rate of return, this means a significant flow of savings (\$1 trillion in our example) out of yen-denominated assets and into assets denominated in foreign currencies. What would be the consequences of such a massive reallocation?

For the banks, at least on the first go around, this makes little difference: since they hold a large share of JGBs in their portfolios, the outflow of deposits can be accommodated by simply selling off some of those JGBs. The only cost would be from the loss of the (tiny) spread between the rate earned on JGBs and the rate paid on deposits, and because JGBs have a zero risk weighting, the shift would leave banks' Basle capital ratios unchanged.

But what happens to the \$1 trillion worth of JGBs sold off by the banks? This is the point at which monetary policy comes into play. Absent any response by the Bank of Japan, the shift out of yen-denominated assets would drive up domestic interest rates: specifically, a higher interest rate would be required to find buyers for the freed-up JGBs on the international market (or alternatively to a more competitive domestic market), and their interest rates would tend to rise towards the level of comparable assets, such as US Treasury securities. (Of course, the outflow of capital from Japan would in part reduce interest rates in global markets, but this effect would be small relative to the increase in Japanese rates.) Another effect of the shift out of yen-denominated assets would be a depreciation in the yen, which goes hand-in-hand with the increase in the capital account deficit (which implies an increase in the current account surplus). Thus, an increase in Japanese savers' taste for foreign assets would be something of a mixed blessing for aggregate demand, with higher interest rates offset by a weaker currency.³³ Higher interest rates would exacerbate the fiscal sustainability problem, however.

An active response on the part of the BoJ would significantly alter this scenario. Faced with Japanese savers' abandonment of the JGB market, and the prospect of rising longer-term interest rates, the BoJ could respond with stepped-up purchases of JGBs—essentially monetizing the government's outstanding debt. This would tend to keep nominal interest rates low. Furthermore, by increasing inflationary expectations, such monetary expansion would in principle decrease *real* rates, and lead to a further fall in the value of the yen. In other words, this particular outcome might be just the right policy to combat the current deflationary environment.

The reservoir of captive domestic savings has therefore been one factor contributing to the continued efficacy of traditional fiscal policy measures in Japan (sustainability concerns notwithstanding).

³³The yen would still be stronger than it would have been in the absence of a fiscal expansion, of course.

Ironic ally, however, this same source of low-cost funds to finance the government deficits may have let policymakers to “get off easy,” in the sense that it has allowed them to defer the sort of aggressive actions needed to break the deflationary spiral, and pull the economy out of its prolonged recession.

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Table 1 The dynamic impact of fiscal policy
(estimated yen-denominated impulse responses)

Effects of expansionary ¥100 shocks, in yen

	Impact of -¥100 tax shock			Impact of +¥100 spending shock		
	Taxes	Spending	GDP	Taxes	Spending	GDP
Year 0	-96	3	16	20	100	84
Year 1	-32	16	158	34	87	105
Year 2	0	36	168	37	77	89
4-year cumulative	-111	104	484	127	332	353

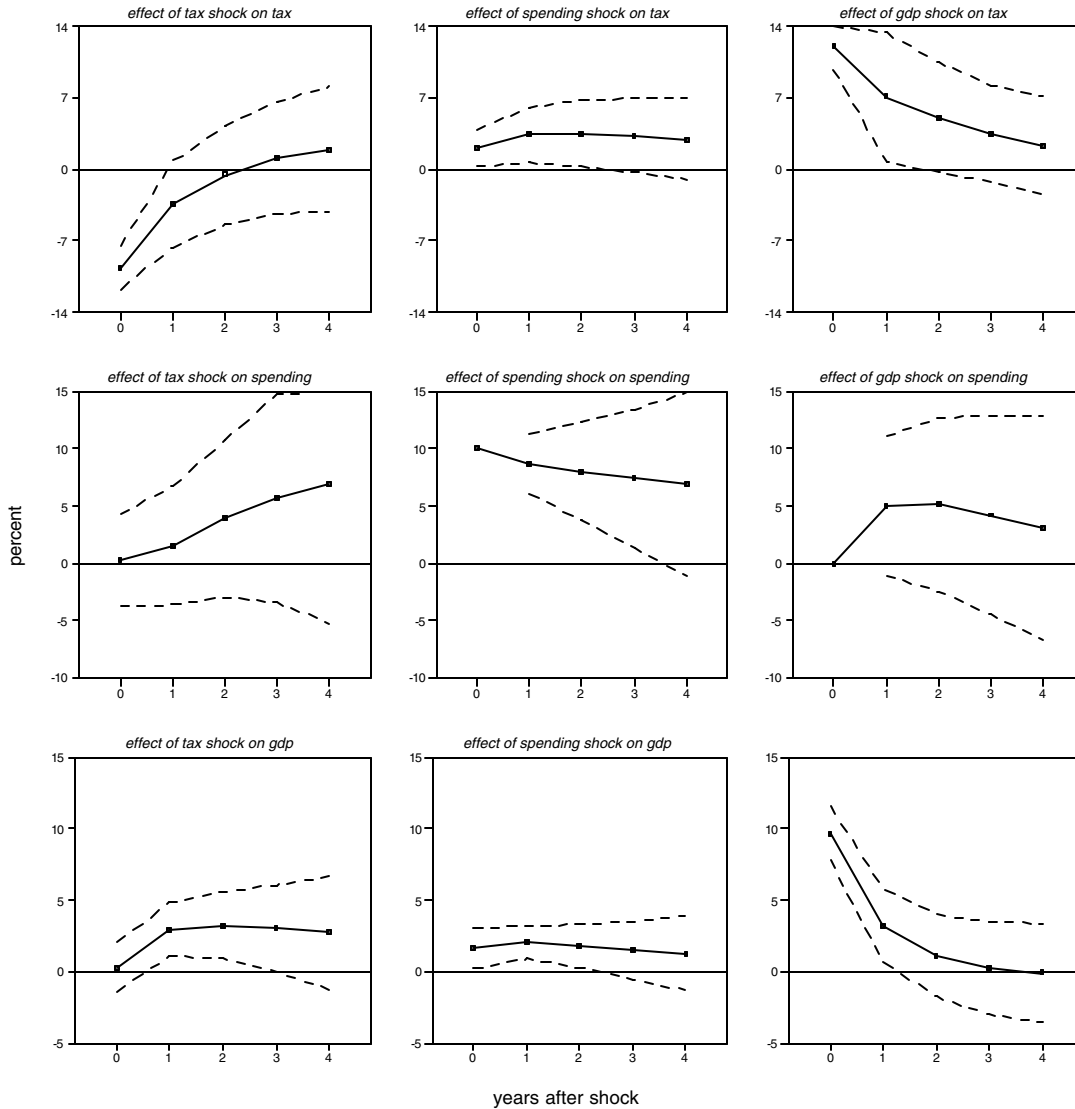
Source: Authors' calculations based on the estimated structural VAR. The impact of ¥100 tax and spending shocks are computed assuming taxes and spending represent 19 percent of GDP.

Table 2 The long-run relationship between saving and fiscal policy
(results from savings rate regressions)

		Equation		
		1	2	3
Constant	α	30.6 ^{***}	38.4 ^{***}	37.9 ^{***}
Old age dependency ratio	β	0.11 ^{***}	0.12 ^{***}	0.17 [*]
Fiscal balance (revenues – expenditures)	γ_1	-0.12 ^{**}	ρ	ρ
Tax revenue	γ_2	ρ	-0.31 ^{**}	-0.32 ^{**}
Government expenditure	γ_3	ρ	-0.10	-0.09
Social Security balance	γ_4	ρ	ρ	0.30
Net interest expenditure	γ_5	ρ	ρ	0.13
\bar{R}^2		0.481	0.578	0.585
Durbin-Watson statistic		1.25	1.51	1.48
Phillips-Ouliaris Z_t test statistic		-5.23 ^{***}	-5.46 ^{***}	-5.10 ^{**}

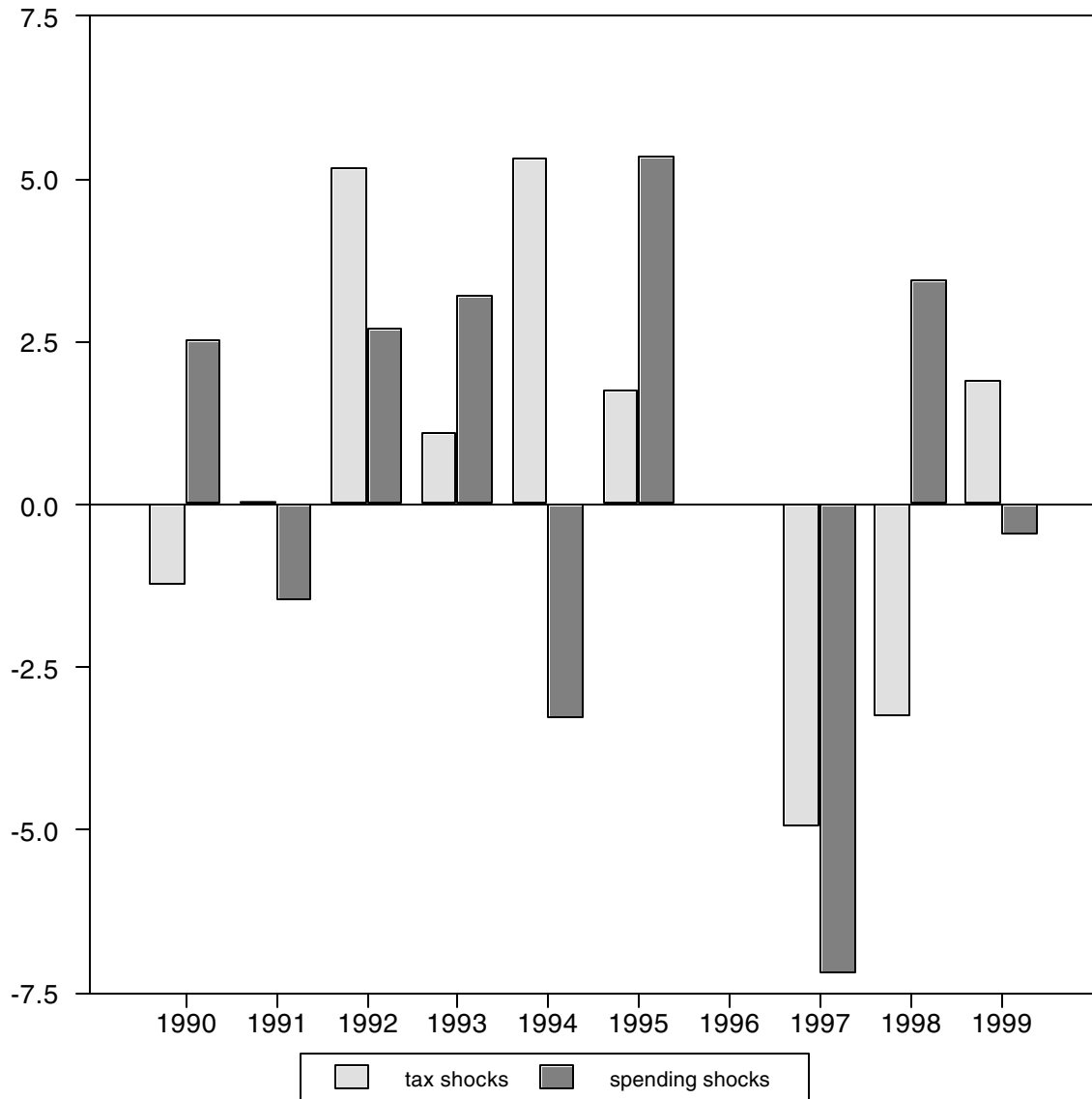
Notes: The dependent variable is private saving, as a share of GNP net of taxes, plus social security payments. Fiscal variables are expressed as a percentage of GNP. Estimation is by OLS on annual data spanning fiscal years 1976 through 1999. Asterisks indicate statistical significance: *** for 0.01, ** for 0.05, and * for 0.10.

Figure 1 Estimated impulse responses from structural VAR



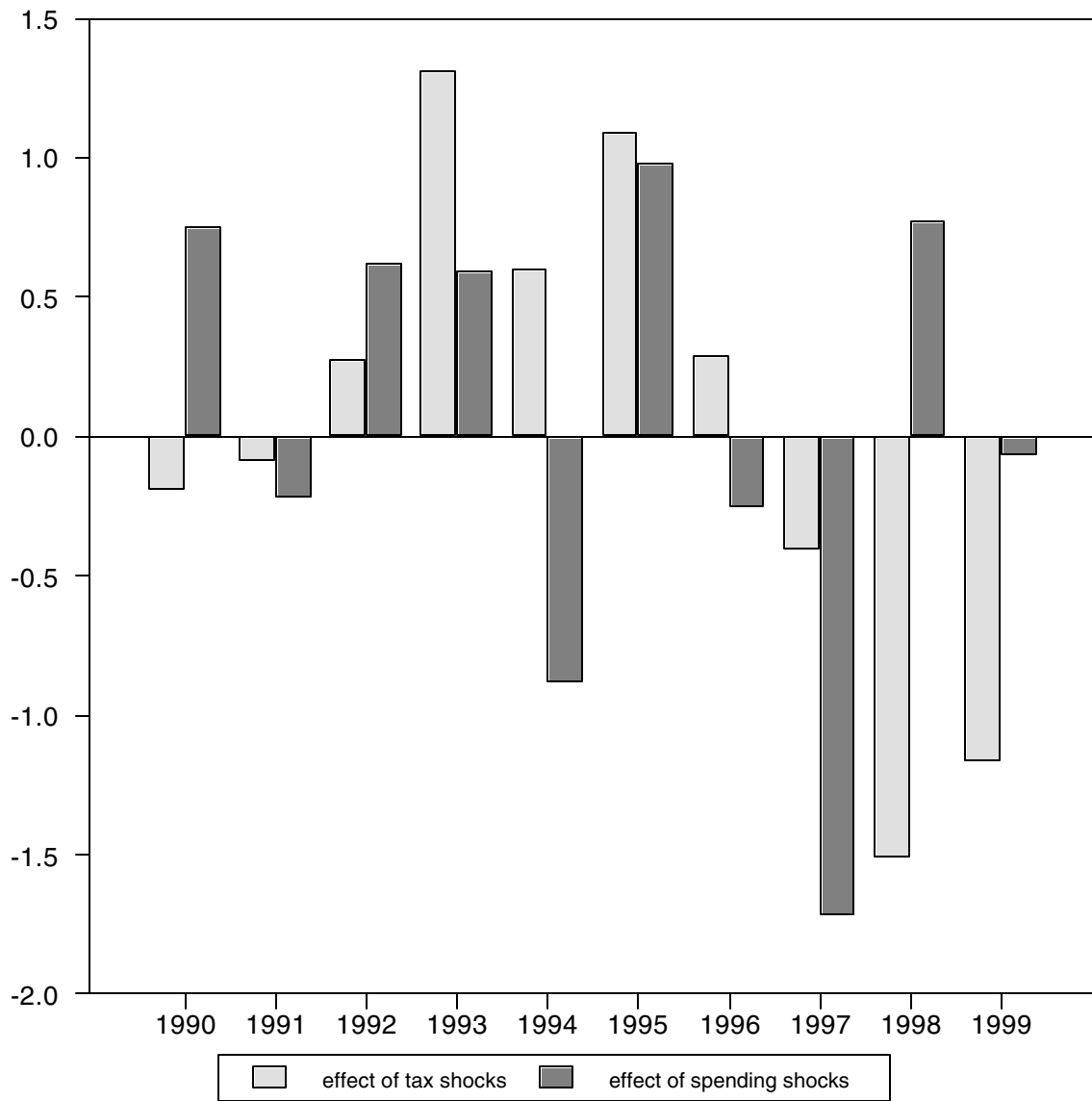
Notes: Standard errors computed via monte-carlo integration. Dashed lines are 90 percent confidence intervals. No standard errors are given for the contemporaneous effects of GDP and spending shocks on spending, as these are fixed by assumption. The tax shock represents a tax cut, and the spending shock represents a spending increase.

Figure 2 Estimated tax and spending shocks



Notes: The tax shock represents a tax cut, and the spending shock represents a spending increase. Vertical axis scale represents the percentage deviation from the predicted path of spending or taxes in the absence of any shocks. The shocks are zero in 1996, as the model includes a dummy variable for this year to capture the impact of the announced increase in the consumption tax.

Figure 3 Estimated historical impact of tax and spending shocks on real GDP growth



Notes: Estimated impact is from the historical decomposition of the fluctuations of real GDP around its trend into the cumulative impact of the model's shocks.