

## Director's Message

Finn Kydland

In this issue, we summarize the presentation and discussion of each of the papers presented at the LAEF conference on *Old and New Ideas about Fiscal Policy*. As usual, each presenter had been allocated an hour, during which members of the audience could interrupt with questions and comments at any time. The program for the conference was put together by **Eric Young**, Associate Professor of Economics at the University of Virginia, and **Daniel Carroll**, Research Economist at the Federal Reserve Bank of Cleveland.

Many developed economies have greatly expanded their public sectors in response to the recent global downturn. Large budget deficits arising from financial-sector bailouts and what are commonly referred to as automatic stabilizers and stimulus measures have led to greater public scrutiny of tax and spending policies, heightened concerns about the sustainability of these policies going forward, and have raised questions about the credibility of sovereign debt. Adding further complication, recovery in these economies remains weak, so that policymakers face pressure to engage in seemingly conflicting actions: more accommodative monetary policy and more disciplined fiscal policy. The purpose of this conference was to bring together expert scholars to discuss what is known about fiscal policy, what we have learned recently, and how this knowledge applies to the current environment.

We learned that while raising personal income taxes generates more revenue for closing deficits than either increasing corporate income taxes (Mertens and Ravn) or cutting government spending (Ramey), doing so is also more contractionary. In addition, while central bank independence is important for the government's ability to finance expenditures while avoiding high inflation (Martin), even this may not be enough to stave off a high-inflation equilibrium if the market loses faith in the government's ability to reduce deficits (Leeper and Walker). These insights, as well as others from the conference, are particularly timely as the President and Congress search for a resolution to the nation's budget problems and the Federal Reserve continues its unprecedentedly accommodative monetary policy.

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The next issue of *From the Lab* will feature proceedings of the third annual "Advances in Macro-Finance" conference, co-sponsored by LAEF and the Tepper School of Business, Carnegie Mellon University. After being held in Pittsburgh the previous two years, LAEF was pleased to host the 2012 conference in Santa Barbara.

# Old and New Ideas about Fiscal Policy

MARCH 30-31, 2012

## VISITING CONFERENCE PARTICIPANTS

**Francesco Bianchi** — *Duke University*

**Daniel Carroll** — *Federal Reserve Bank of Cleveland*

**Pablo D'Erasmus** — *University of Maryland*

**Stefano Eusepi** — *Federal Reserve Bank of New York*

**Roger Farmer** — *University of California, Los Angeles*

**Lorenz Kueng** — *University of California, Berkeley*

**Fernando M. Martin** — *Federal Reserve Bank of St. Louis*

**Karel Mertens** — *Cornell University*

**Valerie Ramey** — *University of California, San Diego*

**Ricardo Reis** — *Columbia University*

**Harald Uhlig** — *University of Chicago*

**Martin Uribe** — *Columbia University*

**Todd B. Walker** — *Indiana University*

**Eric Young** — *University of Virginia*

**Carlos Zarazaga** — *Federal Reserve Bank of Dallas*





Summaries of each of the presentations follow.

Note: speakers are highlighted in author listings.

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## **The Dynamics of Sovereign Debt Crises and Bailouts** *by Francisco Roch and Harald Uhlig*

The European sovereign debt crisis of 2010 has sparked debate on interventions that can prevent default and return yield spreads to pre-crisis levels. Roch and Uhlig develop a model with multiple equilibria and ask how much intervention is necessary to avoid the “bad” equilibrium. As a benchmark, the authors focus on an actuarially fair intervention. An intervention is actuarially fair when the intervening agency earns market return in expectation. Preliminary findings suggest that an actuarially fair intervention by an external facility that guarantees some debt purchase at the “good” equilibrium price reduces, but does not eliminate, default events. The key reason why default events cannot be prevented is that intervention plays a similar role as deposit insurance in models of bank runs. Intervention makes it cheaper for governments to borrow, so governments borrow more until the debt-to-GDP ratio is so high that it cannot be rescued by an actuarially fair intervention.

The analysis of the dynamics of a sovereign debt crisis combines three branches of the literature. First, incomplete markets and concave utility for the government imply that defaults are more

likely when income is low (Arellano, 2008). Second, a debt crisis is a sunspot. The fear of a future default may trigger a current rise in default premia on sovereign debt and thereby raise the probability of default in the first place (Cole and Kehoe, 2000). Third, the government discounts the future sufficiently highly, which leads to high steady state debt levels where a crisis sunspot is possible. This last assumption follows political economy theories of debt accumulation (Beetsma and Uhlig, 1999).

The authors' model features a single government that finances its consumption with tax receipts and assets. Tax receipts are exogenous and stochastic. If the government defaults on its debt obligations, it then pays an exogenous one-time utility cost of default, it is temporarily excluded from debt markets, and it consumes its tax receipts until re-entry into debt markets. The utility cost of default is time-varying and it can be interpreted as an “embarrassment” of default that changes from government to government. Re-entry into debt markets occurs with some exogenous probability.

A conference participant questioned the equivalence of output and tax receipts. Governments usually increase taxes to make up for restricted access to debt markets, as is currently the case in countries like Portugal and Spain, or even expropriate their residents, as in the case of Argentina. Thus tax receipts usually remain roughly constant while output drops during crises. Why not model default as an increase in taxes? Uhlig replied that he believed it is difficult in these models to generate a drop in consumption after default. Another conference participant was concerned that the utility cost of default was a free parameter. Uhlig replied that while including a utility cost opens the door to the free-parameter criticism, it also allows the cost of a crisis to be interpreted broadly. Quantitatively, including a utility cost parameter also allows the model to easily match high debt-to-tax ratios and default rates, something that is generally hard to achieve otherwise. A question arose about the requirement of the model of both a utility cost of default and temporary exclusion from debt markets after default. Uhlig noted that there are many legal reasons why it is difficult to lend to a government that has defaulted. However he agreed that a country's fiscal situation is best after default so, in theory, lenders would want to lend to a country after default.

### *References:*

- Arellano, Cristina (2008), “Default Risk and Income Fluctuations in Emerging Economies,” *American Economic Review*, vol. 98 (3), pp. 690-712.  
Beetsma, Roel and Harald Uhlig (1999), “An Analysis of the Stability and Growth Pact,” *The Economic Journal*, vol. 109, pp. 546-571.  
Cole, Harold L. and Timothy J. Kehoe (2000), “Self-Fulfilling Debt Crises,” *Review of Economic Studies*, vol. 67, no. 1, pp. 91-116.

## **Government Spending and Private Activity** *by Valerie Ramey*

The Great Recession has reignited interest in the role of government spending in stimulating the economy. This debate has generated a growing literature on empirical estimates of GDP multipliers. A recent survey of the literature suggests that the GDP multiplier ranges from 0.8 to 1.5, but could be as low as 0.6 or as high as 3.0. In her paper, Ramey uses a variety of VAR specifications and time periods to study the impact of government stimulus on private spending and employment. She concludes that, on balance, government spending does not appear to stimulate private spending or private employment.

Government spending multipliers are usually calculated by studying the response of total GDP to a government spending shock. Instead of total GDP, Ramey focuses on the response of private spending to a government spending shock. The analysis uses four specifications of VARs: Ramey (2011) News Expectational VAR (EVAR), Blanchard-Perotti (2011) Structural VAR (SVAR),

Perotti (2011) SVAR, and Fisher-Peters (2010) EVAR. Regardless of the VAR specification, the author finds that an increase in government spending does not lead to a significant rise in private spending. This finding holds regardless of whether WWII and the Korean War are included or excluded from the sample. The finding implies a multiplier lower than 1.0. A conference participant noted that the confidence interval in impulse response for the Ramey News EVAR for the 1939–2008 time period shrank over time. Ramey agreed that this observation is interesting and important for discussions on the duration of the impact of government spending.

Historical stimulus measures have mostly been financed by concurrent tax increases. In contrast, the current stimulus will be financed with deficits. This difference on the source of stimulus finance questions the current relevance of GDP multipliers estimated from historical data. To deal with this difficulty, the author performed two experiments. In one experiment, the estimated VARs are used, and then the actual estimated response is compared to one in which tax rates are assumed to stay constant. In a second experiment, the author computes the alternative impulse response based on a dynamic simulation using the actual estimated coefficients from the other equations and the zero coefficient from the tax rate equation. In both cases, taxes do not impact the estimated government spending multiplier. A conference participant suggested that taxes may have no effect when tax information is encapsulated in other variables. Ramey agreed and added that this experiment is not an ideal test of the impact of taxes on multiplier estimates, but it is a starting point.

The last part of the presentation focused on the impact of government spending on labor markets. Ramey finds that increases in government spending lower unemployment. Most specifications and samples imply, however, that virtually all of the effect is through an increase in government employment, not private employment. This led to a discussion of WWII. Proponents of higher government spending point to WWII as an example of the positive impact of stimulus. The unemployment rate went from 12 percent at the start of 1939 to less than 1 percent by 1944. In addition, there were several price controls and rationing, hinting at the possibility that the multiplier during WWII was higher than estimates suggest. Therefore—proponents say—the current stimulus should have an even higher multiplier than WWII. Ramey disagreed, and offered the following argument. First, military employment accounted for the majority of the rise in employment. Second, labor force participation went up significantly during this period, probably because of the draft or patriotism. Finally, labor productivity was also abnormally high. As no one is expecting any of the proposed stimulus policies to increase labor force participation or increase labor productivity, the actual WWII multiplier is probably lower than what would be expected in the current economy.

## Perceptions and Misperceptions of Fiscal Inflation

by Eric M. Leeper and Todd B. Walker

During the Great Recession and the European debt crisis, public debt has ballooned to nearly 100 percent of GDP in advanced economies. Projections of long-run entitlement spending suggest that public debt will continue being a concern. These projections also raise the possibility that economies will hit their fiscal limit—the point at which, for economic or political reasons, surpluses can no longer adjust to stabilize public debt. Leeper and Walker ask: Do profligate fiscal policies threaten the progress many countries have made toward achieving low and stable inflation? The authors use a simple framework to describe and compare various ways in which fiscal policy can directly affect inflation. In particular, the authors emphasize that conventional perceptions of inflation miss the channel of fiscal inflation proposed by the fiscal theory of the price level. Another contribution of the paper is to explain why these fiscal effects are difficult to detect in time series data.

The conventional view is that central banks can control inflation independently of the path of fiscal balances. Sargent and Wallace (1981) showed that this view holds only if fiscal balances remain under control. If fiscal balances grow to the point where the economy reaches the fiscal limit, then the central bank is forced to stabilize debt by printing money and generating seigniorage revenue. Leeper and Walker point out that a common misperception is that the channel illustrated by Sargent and Wallace is the only way fiscal policy can affect inflation. Another channel is provided by the fiscal theory of the price level. This channel becomes relevant if governments issue debt in nominal terms. With nominal debt, an increase in inflation reduces the present value of expected nominal cash flows that determine the value of nominal debt. That is, even if seigniorage revenue were to remain constant, inflation increases the real backing of nominal debt by raising the nominal cash flows associated with primary surpluses. A conference participant asked if the present value equation determining the value of debt is an equilibrium condition or a budget constraint on the government. Walker replied that the debt equation is simply an asset pricing equation, and thus, an equilibrium equation. Walker continued to explain that, once the fiscal limit is reached, the role of central banks is to prevent nominal interest rates from rising sharply with inflation. Keeping interest rates under control prevents debt service from growing too rapidly, which stabilizes the value of government bonds. The fiscal price theory is relevant—Walker explained—because most debt in advanced economies is nominal.

The channel of the fiscal price theory is illustrated using a model with two regimes. In the conventional scenario—Regime M—the monetary authority targets inflation and the fiscal authority stabilizes the value of debt. In the fiscal price theory scenario—Regime F—the monetary authority stabilizes debt and the fiscal authority controls inflation. A conference participant asked why only two regimes were considered; why can't both policies target inflation? Walker replied that, in an extension, he and his co-author consider more diverse scenarios, but having two regimes allowed the focus to be on the fiscal price theory. Walker also clarified that the fiscal price theory does not say that central banks have no impact on inflation. Instead, it says that the monetary authority can anchor expected inflation on the inflation target, but the fiscal authority determines actual inflation. A participant wondered about the importance of excluding sovereign default in the base model. Walker replied that the paper includes an extension of the model with default. Default undermines the central bank's control of inflation even further. With a higher rate of default, the monetary authority must allow the risky rate of interest to rise to induce bondholders to continue holding government bonds. Thus a higher probability of default feeds directly into higher current inflation.

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Sargent, T. J., and N. Wallace (1981): "Some Unpleasant Monetarist Arithmetic," *Federal Reserve Bank of Minneapolis Quarterly Review*, 5 (Fall), 1–17.

## Debt, Inflation and Central Bank Independence

by Fernando M. Martin

A popular view is that central bank independence keeps inflation low, but the causality of the relationship has been questioned in the empirical literature. Martin uses a monetary economy model as in Lagos and Wright (2005) to study the effects of central bank independence. While the standard approach assumes the government can commit to future policy, there is no commitment in Martin's model. The fiscal and monetary authorities are not fully benevolent: each institution values general welfare and government expenditure. The fiscal authority decides taxes, and the monetary authority decides money supply. Should the monetary authority become more benevolent (putting higher weight on general welfare), inflation and taxes decrease, and debt accumulation increases.

A perishable good is produced and consumed during a day market and again during a night market. An idiosyncratic shock at the beginning of the period determines whether an agent will be a

producer or consumer. A lack of commitment and anonymity make money essential for trade. The government provides a public good at night and finances this expenditure by taxing labor income from night production, printing money, or issuing bonds. Government policy is announced at the beginning of the day, even though it is not carried out until night, so day-good trade will depend on monetary policy as well. The greater the government debt, the more incentive it has to inflate away liabilities, despite distortions this would cause during the day-good trade. High inflation increases demand for money which relaxes the government budget constraint. However, this decreases demand for bonds, forcing the government to pay a higher interest rate, tightening the budget constraint. The latter effect will dominate for large values of debt. Martin considers an environment where the monetary authority unexpectedly becomes more benevolent. In order to decrease current distortions, and increase the day-good allocation, there will be a reduction in the money growth rate. The fiscal authority responds with more debt, but in the long run inflation and taxes return to their original values.

A conference participant wondered if it were reasonable that the day-good could only be taxed through inflation. Would the results be different if the fiscal authority could tax both goods? Martin answered yes, this would change the results. The reason only one good is taxed is to ensure that money is essential even after government bonds are introduced. A question arose concerning the timing of government decisions. Martin explained that both authorities make their decisions simultaneously, and consider how their decisions will affect both parties tomorrow.

## Monetary/Fiscal Policy Mix and Agents' Beliefs

*by Francesco Bianchi and Cosmin Ilut*

Most economists would agree that the period of high inflation in the 1970s was due to a combination of expansionary monetary and fiscal policy. Bianchi and Ilut present a micro-founded DSGE model with a switch in monetary and fiscal policy regimes to account for the shift in inflation and debt-to-GDP trends. By modeling the problem of both the fiscal and monetary authorities explicitly, the authors show that had the Ricardian regime have been in place from the beginning, the Great Inflation would not have occurred. Further, the switch in model regime produces the 1980s recession, and also a decline in inflation. Without the regime change, the model predicts that inflation would have continued to grow for a couple more years before transitioning back to steady state.

Under the non-Ricardian regime, inflation is manipulated to stabilize debt. The authors introduce a series of fiscal shocks which cause the fiscal authority to accumulate debt. The response is not increased taxation, but high inflation. The real interest rate falls and growth increases. Because agents foresee high short-term interest rates, the price of long-term bonds falls, and debt declines. After the regime change, the central bank has full control of inflation and applies the Taylor rule. The fiscal authority is committed to keeping debt on a stable path through taxes. The tax increase causes the recession, but the monetary authority reduces the volatility and persistence of inflation. These vastly different outcomes are produced under the same stochastic process for fiscal shocks; the only change is the independence of the monetary authority.

A conference participant asked if the switch from non-Ricardian to Ricardian regime was imposed. Bianchi explained that it was not: the data strongly suggest the regime change in 1980, two quarters into Volker's term as Federal Reserve chairman. Discussion arose over agent expectations, and Bianchi elaborated that agents in the model know Volker is coming with some probability, not with certainty. A key feature of the model is that agents under the non-Ricardian regime act as if this regime will go on forever. If this were not the case, the model as a whole would be Ricardian.

## Prudential Policy for Peggers

*by Stephanie Schmitt-Grohe and Martin Uribe*

Schmitt-Grohe and Uribe ask if capital controls could be welfare-improving for small open economies with free capital flow and fixed exchange rates. In the 2000s, wages increased substantially in the peripheral European Union countries due to large capital inflows that followed capital account liberalization. After the onset of the global recession, nominal wages remained constant. The authors argue that sticky prices, the fall in aggregate demand, and the inability of authorities to devalue wages through inflation caused the large increase in unemployment.

The laboratory for analysis is an open-economy model with tradable and non-tradable goods. Tradable goods and the domestic interest rate are subject to exogenous shocks. Expansions driving up aggregate demand also drive up wages. After a negative shock, wages cannot fall, exacerbating unemployment. In the model, the government is able to levy a proportional tax, or subsidy, on external debt holdings. The authors show that the optimal tax on external debt is positive on average and highly procyclical. Restricting capital inflows during expansions and subsidizing external borrowing during recessions can improve welfare significantly.

Questions arose among conference participants regarding the sticky wages assumption. How do the countries considered in this paper compare to developing nations? In the 1920s for example, England showed strong evidence for sticky wages, while wages fell in the United States. Further, what do we know about the workers who were laid off in this recession? If low-productivity workers lost their jobs, the evidence for sticky wages is weaker. Participants also wondered if the policies in this paper were implementable in practice. Uribe responded that if you believe the wage rigidities story, then wages will increase by too much during any expansion. In order to answer how much wage increase should be curbed, a quantitative, calibrated model is required.

## The Maturity of Debt, Monetary Policy and Expectations Stabilization

*by Stefano Eusepi and Bruce Preston*

Motivated by the latest actions of the Federal Reserve, Eusepi and Preston explore a theoretical mechanism through which a change in the composition of government debt can have effects on economic stability. The authors propose an extension of the standard New Keynesian model where agents have incomplete knowledge about the structure of the economy; more specifically, they don't know the equilibrium mapping between observed state variables and market clearing prices. Instead, they use observed historical patterns to forecast the future. Furthermore, agents use government bonds as their instrument to accumulate wealth and smooth consumption.

The authors use a baseline specification where expectations are rational in order to measure the effects of departures from this benchmark on economic instability. In their baseline, Ricardian equivalence holds and the term structure of government debt does not have an effect on economic activity. On the other side, in their preferred specification, due to prediction error, agents' forecasts are not necessarily consistent with the probabilities specified in the model and Ricardian equivalence does not hold. In this environment, changes in the maturity structure of government bonds imply future changes in the timing of taxation, and because agents predict future tax obligations with some margin of error, the perceived wealth held by households in terms of government bonds is subject to changes over time. Hence, this failure to predict future taxes and real interest rates implies that the term structure of public debt is relevant to households' and firms' decision-making. Furthermore, the scale of average debt matters for economic stability. Countries where government debt is a larger fraction of output are more sensitive to adjustments in the maturity structure since households are the government's creditors, and changes in this structure induce variation in the wealth levels in the economy.



Eusepi concluded with some policy recommendations that are a direct result of the model: first, short to medium maturity debt structures are conducive to economic instability. Second, in this setting, instability is a result of deviations from rational expectations, hence, it is important for households to correctly understand the fiscal authority's policies. Third, public policy should be implemented in such a way to ensure the intertemporal solvency of government accounts. If the government is solvent intertemporally, the model can approximate Ricardian equivalence. Lastly, even when the Taylor rule ensures the determinacy of an expectations equilibrium, there are alternative monetary policies that may be preferable.

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### Tax News: Identifying the Household Consumption Response to Tax Expectations Using Bond Prices

by Lorenz Kueng

Fiscal policy's capacity to stabilize the economy during business cycles is often debated. The main critique of fiscal intervention is that there is a long lag between the policy enactment and its effect on aggregate variables due to slow implementation or slow reaction by households. One of the theoretical reasons for this lag is that households are not forward looking, and react only to short run changes to their income. This is contrary to the basic rational expectations theory where agents adjust their behavior rapidly to unexpected lifetime income changes, and they do so shortly after they acquire news about this change, not necessarily when the policy takes effect. Hence, in order to distinguish between these competing arguments, Kueng studies variation in household consumption behavior caused by news about changes in after-tax lifetime income. In the basic rational expectations theory, households' consumption should not respond to predictable income changes, and households should respond one-for-one to unexpected news about changes in after-tax lifetime income. Kueng measures the ability of households to react to news of after-tax income changes through the market mechanism of municipal bonds. He compares the yields of Treasury bills, which are subject to taxation, and tax-exempt municipal bonds, and relates the term structure of the spreads to the path of expected tax rates and tax premiums, thus measuring changes in households' expectations about future tax characteristics. Once the households' expectations and reactions to news are pinned down, the author relates this variation to changes in households' consumption behavior using the Consumer Expenditures Survey (CES).

Kueng finds that high income households react to tax news very quickly and can predict the path of future tax changes with a high degree of accuracy. The author shows that non-durable consumption for these households increases by 1.1 percent in response to news about a 1.0 percent increase in after-tax lifetime income, which provides evidence in favor of the basic rational expectations hypothesis. Similarly, when taking a sample of all taxpaying households, the consumption response is an increase in consumption of 0.5 percent, and is sufficiently precise to reject responses of 0.0 percent and 1.0 percent, respectively. Hence, the rational expectations theory cannot be rejected, while the hypothesis that there is no response is strongly rejected. Furthermore, the author considers only large shocks, those of magnitude above the median, and finds the consumption response of 1.1 percent. These results are consistent with rational inattention, near rationality and heterogeneous formation of expectations across households.

The main implications of Kueng's paper give an answer to Deaton's paradox. This paper shows that due to heterogeneous household response to income changes, the aggregate consumption series can be smooth, even if the income series are more volatile. Furthermore, it suggests that timing of individuals' response to new information might make fiscal policy a suitable tool for countering business cycle fluctuations. Kueng concludes that if a fiscal policy can cause large changes in lifetime income, is credible, and its design is not counter-cyclical, it might cause changes in aggregate consumption even before the actual policy is put into place, especially for high income households.

During the conference, the participants' main concern was about the choice of municipal bonds used for this analysis. The author was able to show that his choice of a particular subset of municipal bonds allowed for a good comparison with Treasury bills, and the yield spread was a good proxy for changes in lifetime income for the sample population, especially for high income households.

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### The Dynamic Effects of Personal and Corporate Income Tax Changes in the United States

by Karel Mertens and Morten O. Ravn

Mertens and Ravn provide a new estimate for the elasticity of aggregate variables to changes in the average tax burden and the associated multipliers. The myriad of tax policy instruments and endogeneity makes the identification of effects of policy change very complicated. The authors develop new methodology that merges two econometric techniques, structural vector auto-regressions and the event narrative approach, and in doing so, improve on the respective weakness of these two methodologies; they impose more intuitive restrictions on the structural shocks of vector auto-regressions and the event narrative approach.

Tax proxies are chosen carefully to make sure that they are exogenous to other structural tax shocks, and restricted to the current quarter to avoid anticipated aggregate responses. The authors estimate that a 1.0 percent change in the average personal income tax rate (APITR) raises GDP per capita contemporaneously by 1.4 percent and up to 1.8 percent after three quarters. This translates into an income multiplier of 2.5. Simultaneously, this marginal tax change raises employment, lowers the unemployment rate, and increases hours worked per worker. Furthermore, the authors find that it increases private sector investment and stimulates private consumption in non-durable goods in the short run. They find that this change had short lived effects on inflation, and did not translate into significant changes in government spending or nominal interest rates. Similarly, a 1.0 percent cut in the average corporate income tax rate (ACITR) has an impact of 0.4 percent on GDP contemporaneously and 0.6 percent after one year. This change has no significant impact on tax revenue, hence the multiplier is not well defined. Furthermore, they found no immediate impact on employment, hours worked, or private consumption, and only a moderate increase in private sector investment.

The authors' new approach also yields a measure of the reliability of the narrative series as proxy for the latent tax shocks. This measure estimates the squared correlation between a linear combination of the narrative shocks and the true structural tax shocks. Their reported values are the lower bound estimates which are 0.55 and 0.83 for APITR and ACITR, respectively. This tells us that these proxies contain a lot of information about the latent shocks, but there are considerable measurement error problems. In conclusion, the authors' estimates show that the federal tax multiplier is likely larger than that associated with federal government purchases in the literature. Hence, if the administration wants to promote short-run job creation and consumption, a cut to personal income taxes is more effective than using corporate income taxes, and this strategy is more effective than government spending in the long run. On the other hand, an increase in corporate income taxes does not increase tax revenue, whereas an increase in the personal income tax rate would, but at the cost of losing jobs, private consumption, investment, and output.

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### Does Fiscal Policy Matter? Blinder and Solow Revisited

by Roger Farmer and Dmitry Plotnikov

Historically, one of the leading theories about the causes of the Great Depression is the lack of aggregate demand, fueled by the declining value of assets that started with the stock market crash of 1929. Farmer and Plotnikov build a model

in the neoclassical tradition that includes a measure for aggregate demand and that does not rely on sticky prices to propose a mechanism through which a fiscal expansion can reduce unemployment.

Farmer and Plotnikov's representative agent model with Keynesian unemployment has a fixed amount of capital, and households provide a unit of labor inelastically. All the nominal aggregate variables in the model are deflated by the money wage, and employment is defined as the portion of households that find work in the labor market. Most importantly, the authors model a connection between household wealth and intertemporal decisions through the price of assets, which is an integral part of the nominal interest rate. The price of assets, which determines the value of assets in the economy, is exogenous, and is modeled as a sequence of self-fulfilling beliefs and is calibrated to the S&P 500 data series. The authors call this sequence the state of expectations. The main implications are: first, the national income accounting identity implies a one-for-one reduction of consumption to a unit increase in government spending, producing a crowding-out effect of fiscal expansion. Second, in equilibrium, a temporary increase in government spending can reduce unemployment in the short run. Using these results, the authors calibrate their model to the U.S. economy and replicate the increase in government spending caused by WWII. They show that their model can closely follow the behavior of consumption and unemployment during the onset of the depression and during the following decades.

Most of the discussion during the presentation was directed towards the appropriateness of using fiscal expansion as a stabilizing policy, and whether the government should regulate the stock market in a similar fashion as the bond market in order to use it as another policy tool. The conference participants agreed that in this setting, the temporary expansion of government spending would have to be large, and most likely would cause a reduction of welfare because of the crowding-out effect to consumption. Hence, it might not be the most effective tool in a policymakers' kit. On the other hand, there was no accord as to whether it is appropriate to manipulate the stock market value to match a benchmark, with the main argument for the intervention being that it has already been done successfully in the bond market, but many participants were weary of the implications for firm incentives.

## Domestic Sovereign Debt as Optimal Redistributive Policy

by Pablo D'Erasmus and Enrique Mendoza

Since 1750, there have been 68 episodes of government debt default that were not financed by inflation. This fact, combined with current high levels of sovereign debt around the world – with developed countries averaging 100 percentage of GDP – makes thinking about the dynamics of government default a timely and apposite endeavor.

There are complex dynamics in the government's decision to default that current models do not capture. Specifically, governments have to decide which kind of debt they are going to default on and the effects of their actions on the structure of debt ownership. D'Erasmus and Mendoza answer these questions by focusing on the market for debt issued in the local currency. This market is six times larger than the external debt market, with domestic creditors purchasing debt issued in the local currency in many instances, amounting to two-thirds of outstanding obligations. Given the correlation between debt issued in local currency and that domestically held, D'Erasmus and Mendoza model government debt as one period, non-state-contingent bonds that are sold only domestically.

In the authors' model, the government faces an exogenous stream of expenditures, maximizes a utilitarian welfare function, decides

the level of lump sum taxes levied on households, issues and services debt, and decides whether or not to default. Households are heterogeneous and are constrained in the amount of debt they can incur, and use government bonds as a way to smooth consumption. The borrowing constraint and idiosyncratic household shocks generate a distribution of wealth, measured by the quantity of government bonds held by each household. Since default is non-discriminatory and it limits the government's access to the credit market for a finite length of time, the government has to weight in the short and long term costs of default to poor and wealthy households. In the short run, a default reduces the level of taxes paid by all agents, since there is no debt to be serviced, but it reduces the wealth of all households holding debt. Furthermore, because the government cannot access the credit market, households lose the only instrument they have to smooth consumption, and face volatile taxes as a result. In the long run, a default induces aggregate risk in the economy and determines the expected return to government debt. On the other hand, if there is no default, the government uses taxes and debt to meet its obligations. Hence, depending on the welfare function chosen, defaults are inherently redistributive. The authors calibrate their model to some characteristics in the Spanish economy, and their preliminary results show that they can generate government debt thresholds, rising bond spreads, and default occurrence probabilities similar to those observed in past default episodes.

## Measuring the Role of Automatic Stabilizers in the U.S. Business Cycle

by Ricardo Reis and Alisdair McKay

The current economic conditions and the strong fiscal response to the latest recession have brought the attention of a number of economists to the effectiveness of public policy as a countercyclical tool. Automatic stabilizers like unemployment benefits, progressive income taxes, means-tested transfer programs, and changes in the government budget constraint, i.e. deficits and surpluses, are widely regarded as valuable instruments to ameliorate the effects of the business cycle, unlike other public policies. However, very little work has been done on the subject recently. Using many of the innovations from public finance and business cycles literature, Reis and McKay build a model to discuss how strongly automatic stabilizers affect the volatility of aggregate output and employment.

The public finance literature evaluates the effects of stabilizers as the difference in volatility among pre-tax and after-tax household income, and abstracts from the effects of these changes on household work incentives and aggregate effects on output and employment. The authors fill this gap by building a model rich enough to recognize these effects: stabilization of household income, intertemporal incentive and general-equilibrium effects. The way that Reis and McKay can produce these quantitative properties is by introducing key concepts from many areas of research. The model incorporates nominal rigidities, in the Keynesian tradition, which allows aggregate demand to play a role in the business cycle. Agents optimize intertemporally, in the neoclassical fashion, so incentives and relative prices matter – this includes distortions in the allocation of labor and capital by taxes and transfer systems. Households are heterogeneous and there are incomplete insurance markets. Hence, automatic stabilizers imply a redistribution of resources across households that have an effect on the aggregate economy.

Reis and McKay calculate the cost of stabilization in terms of the average level of economic activity for the mentioned instruments, and show that they can be quantitatively important. Furthermore, they show that redistribution is a crucial stabilizing force in the economy, and that transfers have large multipliers. Together, these results provide a new tool to measure the effects of stabilization and a new approach to solve incomplete market models with nominal rigidities.



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