Discussant comments on "Fiscal Policy in a Depressed Economy" by J. Bradford DeLong and Lawrence H. Summers

Comments by Valerie A. Ramey, June 26, 2012

This paper proposes the very intriguing idea that government stimulus packages enacted during a severe downturn can be self-financing. DeLong and Summers have actively participated in the public debate on this issue, both formally in government and informally on blogs, so a paper on this topic by them is particularly interesting. When I was first asked to discuss a paper on fiscal policy by DeLong and Summers, I felt the same kind of anticipation that I did for the Olympics in the early 1990s. Why? Because those were the first Olympics in which athletes who had gone pro were allowed to come back and compete with the amateurs. The highlight of the 1992 Summer Games was the "Dream Team" of basketball. The American team had players such as Michael Jordan, Magic Johnson, and Larry Bird. The Dream Team beat every other team by huge margins and won the gold. After that experience, everyone eagerly anticipated the return to the 1994 Winter Olympics of the previous gold medal ice skaters who had gone pro – skaters such as Katarina Witt, Brian Boitano and ice-dancers such as Torvill and Dean. However, the returning pros did not do as well in the Winter Olympics. Although they all skated beautifully, it turns out that Olympic judges put more emphasis on precision than the audiences they had performed for as pros. Thus, Torvill and Dean only got the bronze and the rest didn't even medal. The question then is are DeLong and Summers the "Dream Team" or Torvill and Dean?

In my discussion, I will first summarize DeLong and Summers' idea and highlight some notable elements of their model. Since a key part of their hypothesis is the ability of government spending to reverse hysteresis effects, I will offer some evidence that can be viewed as a test of these effects. I will then go on to assess the notion that appears in this paper as well as several others from the literature that the multiplier may be higher during periods of interest rates at the zero lower bound and high economic slack. Finally, I will offer a word of caution on extrapolating from past interest rates.

Summary of the DeLong and Summers Idea

DeLong and Summers very clearly present their main idea and their view of how the economy works. They argue that most of the time output is supply-determined and is equal to potential output (such as in a neoclassical model). Government spending has no impact on output. During times such as the Great Recession and its aftermath, however, output is below potential and is demand-driven. In a depressed economy, government spending can raise output.

In addition, the authors assume that current output levels can have an effect on future potential output, and thus on future output during supply-determined times. This is a *hysteresis* effect. Blanchard and Summers (1986) first introduced the idea of hysteresis effects in the context of lingering high unemployment and Europe. In that context, they appealed to insider-outsider theories of labor

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markets to motivate the notion of hysteresis in unemployment rates. In the present context, DeLong and Summers appeal to various factors such as the deterioration of the skills and labor force attachment of the unemployed and the long-term effect on capital of depressed investment rates. They present a very useful summary of the literature on micro evidence on persistence of labor supply decisions as well as macro evidence the link between financial crises and subsequent output growth.

On top of this structure, the authors also consider the unusually low interest rates prevailing in the U.S. economy. These low interest rates potentially have two effects. First, as numerous papers have argued, when interest rates hit the zero lower bound (ZLB) monetary policy becomes impotent and fiscal policy can become more powerful than usual. Second, the low interest rates have an additional effect – budget deficits can become very cheap to finance.

This view of how the economy works naturally leads to DeLong and Summers' main conclusion: for a variety of parameter values short-run increases in government spending during a slump can pay for themselves in the long-run. The obvious implication is that we should not let fear of government budget deficits prevent us from enacting another stimulus package in order to stimulate aggregate demand. This conclusion is essentially the Keynesian version of "Supply-side Economics," which the Reagan Administration used to argue that tax cuts could stimulate the economy enough so that tax revenues would actually rise. Another way to look at it is the new version of Say's Law "In a depressed economy, government spending creates its own financing."

Notable Features of the DeLong and Summers Model

The DeLong and Summers (DS) model has more in common with standard undergraduate textbook macroeconomic models than the typical models used at the graduate level or in research papers. For example, there is no discussion of the assumptions about fundamentals such as preferences, technology, and resource constraints. Also, the DS model is missing the "GE" of the DSGE model, for there is no general equilibrium. The paper is silent on why interest rates are so low and why we should expect them to remain so low. Overall, the model is quite stripped down relative to standard modern macroeconomics models.

There are advantages and disadvantages of presenting this idea in such a simplified model. The advantages are several. First, because the model is so stark, the idea is very clearly presented and not obfuscated by inessential technical details. Second, because the idea is not presented in the context of one of the standard macro models, it avoids the use of their sometimes questionable assumptions.

There are, however, some disadvantages to the approach. The reason that modern macroeconomics has moved to models with carefully specified assumptions and microfoundations is that without them, one can often end up implicitly making contradictory or dubious assumptions. The reason that one can find many faults with modern macroeconomic models is that they are perfectly explicit about their assumptions. While these models have a long way to go to find better ways to model the economy, I do not think that replacing them with models based on imprecisely specified intuitive ideas is an improvement.

Key Equation from the DeLong and Summers Model

Delong and Summers' idea boils down to one key equation that is derived from their assumptions about government spending multipliers and hysteresis. According to their model, an increase in government spending to stimulate the economy during a recession can be self-financing (in the sense of generating an increase in annual tax revenues sufficient to pay for the increase in annual debt service) if the following condition holds:

$$r < g + \frac{\eta \mu \tau}{1 - \mu \tau}$$

r is the interest rate on government bonds, *g* is the growth rate of potential output, η is the hysteresis effect of current output on future potential output, τ is the tax rate and μ is the government spending multiplier. The intuition behind this equation is as follows. If output is below potential, then output can be spurred by an increase in government spending. How much output rises for a given dollar increase in government spending by the multiplier. This increase in current output is then translated into higher future potential output through the hysteresis effect η . These two effects imply that for a given tax rate τ , future annual tax revenues will increase more than the required increase in annual debt service.

I will devote the rest of my discussion to exploring some evidence on three of the five parameters of this equation: the hysteresis parameter η , the government spending multiplier μ , and the long-term interest rate r.

The Hysteresis Parameter η

DeLong and Summers include a very nice summary of literature on various features that could lead to hysteresis. Estimating the extent of hysteresis is very difficult since it is difficult to distinguish whether a deep recession itself leads to lingering effects ("state dependence") or whether whatever caused the recession has persistent effects ("unobserved driving forces"). Nevertheless, the evidence compiled by DeLong and Summers is quite interesting. One of the mechanisms they discuss is the potential loss of worker skills or labor force attachment that might result from extended periods of unemployment. The recent evidence by Davis and von Wachter (2011) that shows significant and persistent losses in income to workers who are displaced during a recession is certainly suggestive. As Robert Hall points out in his discussion of Davis and von Wachter (2011), however, whether losses to individual workers represent social losses or just redistributions of rents remains to be seen, however.

A second mechanism for hysteresis discussed by DeLong and Summers is private investment. They argue that shortfalls in private investment during a recession can lead to persistent effects through reductions in the capital stock.

As Delong and Summers themselves recognize, most of their arguments suggest persistent, but not permanent, effects. A positive depreciation rate on the hysteresis effect can have a sizeable effect on their calculations. For example, consider the simulation results shown in Table 2.2, with a hysteresis parameter of 0.025 and a multiplier of 1.5. Their equation shows that as long as the real government interest rate is below 4.95%, a stimulus package is self-financing. Suppose we use the same parameters, but assume instead that the hysteresis effect has a depreciation rate of 10 percent per year. In this scenario only half of the necessary tax revenue is being collected six years in the future. Thus, their calculations hinge importantly on their assumption of *permanent* hysteresis effects.

For the sake of argument, suppose that there are permanent hysteresis effects. DeLong and Summers' argument also requires another assumption to support their policy prescription of more stimulus spending. In particular, they must assume that raising output with government spending can reverse the hysteresis effect. It is not obvious to me that an increase in government spending would create the private investment and skill-building jobs required to reverse the effect.

Even without specifying the individual mechanisms, we can test this hypothesis on U.S. data. In particular, if DeLong and Summers' argument is correct, if G raises Y in the short-run, then it should have a persistent effect on output. That is, if we identify exogenous movements in government spending that lead to temporary increases in government spending, we should see a much more persistent effect on output if there are hysteresis effects. To study this, I use my analysis from Ramey (2011, 2012) which identifies exogenous shocks as military events that generate changes in the expected present discounted value of government spending. I also use a Blanchard and Perotti (2002) type of identification to show that the results are not limited to just my identification method. The models are estimated from 1939q1 to 2008q4. The VARs contain log real per capita government spending, log real per capita GDP, the Barro-Redlick (2011) average marginal tax rate, the three month treasury bill rate, log per capita total hours, and log per capita real nonresidential investment (all in levels). The Blanchard and Perotti SVAR identifies the shock to be the shock to government spending, ordered first in the VAR. My EVAR ("Expectational VAR") includes my military news variable ordered first and uses shocks to it as the government spending shock. Four lags are used and a quadratic trend is included. 95 percent confidence intervals are shown based on bootstrap standard errors.

Figures 1 and 2 show the impulse responses of four of the variables of interest: government spending, real GDP, total hours, and nonresidential investment. In both specifications, a shock raises both government spending and real GDP. They both peak around 6 quarters and are back to normal by 16 quarters. Total hours also rise, but nonresidential investment falls. Thus, in the historical data, investment is moving in the opposite direction to that which DeLong and Summers' hysteresis effects would need. Nor is there evidence of a persistent effect of government spending on real GDP. Since my news variable captures only movements in government spending based on military events, one might wonder whether other types of government spending would have more long-lasting effects.

The results using Blanchard and Perotti's framework uses a shock is to all types of government spending, and yet there is no more evidence of persistent effects on output.

In sum, this evidence does not provide support for the notion that an increase in government spending that raises output in the short-run has lingering effects on output.

The Government Spending Multiplier μ

My recent paper (Ramey (2012)) uses a more precise way to estimate the multiplier in both a VAR and an instrumental variables regression. In particular, it looks at the effect of government spending on private spending (Y – G). This method indicates that multipliers are significantly below unity – about 0.5 when tax effects are accounted for. DeLong and Summers and numerous others have argued, however, that the multiplier may be higher when there is slack in the economy (Auerbach and Gorodnichenko (2011)) or when interest rates are at the Zero Lower Bound (Eggertsson (2001)).

In principle, it is possible to test this hypothesis on historical data. In work in progress, I have been studying the period 1933 to 1951. As Figure 3 shows, this period was characterized by very low interest rates, similar to today's interest rates, as well as times with very high unemployment rates. Of course, the presence of World War II, with patriotism raising labor force participation rates and controls on the economy dampening consumer spending, make the period very complex. It is nonetheless interesting to at least search for differential multipliers during this period.

For this period, I thus estimate the following equation:

$$\frac{\Delta Y_t}{Y_{t-1}} = \beta_0 + \beta_1 \frac{\Delta G_t}{Y_{t-1}} + \beta_2 \frac{\Delta Y_{t-1}}{Y_{t-2}} + I_t \left[\beta_0' + \beta_1' \frac{\Delta G_t}{Y_{t-1}} + \beta_2' \frac{\Delta Y_{t-1}}{Y_{t-2}} \right] + \varepsilon_t$$

where Y is real GDP, G is real government spending, I is a dummy variable that takes the value of one when the unemployment rate is above seven percent, and ε is the error term. I allow all of the coefficients, including the multiplier, to vary according to whether the unemployment rate is above or below 7 percent. β_1 gives the multiplier when the unemployment rate is below 7 percent; $\beta_1 + \beta'_1$ gives the multiplier when the unemployment rate is above 7 percent.

The data used are monthly from 1933m1 to 1951m3 (the month when the Treasury Accord was signed). The GDP and government spending data are from Gordon and Krenn (2011). The unemployment series are based on my data collection and include emergency workers. In order to

address both the possible endogeneity of government spending and the impact of measurement error from the way that Gordon and Krenn construct their interpolated series, I instrument for government spending growth with lags two through four of government spending growth (relative to GDP).

The estimate of the multiplier β_1 when the unemployment rate is below 7 percent is 0.581, with a standard error of 0.119. The increment to the multiplier during slack times is estimated to be -0.012 with a standard error of 0.535. Thus, there is no evidence of a higher multiplier during slack times, though the high standard error indicates substantial uncertainty.

This simple analysis finds no support for multipliers that are higher during times of slack and accommodative monetary policies. The analysis presented above is quite simple, and there is some evidence to the contrary in later periods, so more research should be done of this issue.

The interest rate r

DeLong and Summers look at historical data on long-term government interest rates to argue that it is unlikely that interest rates will rise significantly. It is always wise to bear in mind the Lucas Critique (Lucas (1976)). In particular, the historical data were not generated in a regime in which entitlements were projected to lead to every-rising deficits as is the current situation.

To illustrate the perils of extrapolating from the past, consider "A Tale of Two Countries" shown in Figures 4. Figure 4A shows the interest rates on long-term government bonds for two countries from 2000 though 2007. Both countries displayed similar patterns in interest rates over this period.

Now consider the paths of interest rates in the two countries when the sample is extended through 2011. The interest rate in Country B suddenly explodes and reaches 25 percent. Country A is the U.S. and Country B is Greece. If one had just extrapolated from the past behavior of interest rates, one would have never predicted that interest rates would rise so far in Greece. Thus, current low interest rates should not be taken as a sign of future low interest rates.

Conclusions

DeLong and Summers present the very intriguing idea that government spending can be selffinancing when it is used to stimulate an economy in which output is below potential. Although I have concerns about the lack of rigor of their theoretical model, the idea is still quite interesting and worth studying further. My simple empirical investigations of hysteresis effects and multipliers, however, indicate that those parameters might not be as high as they need to be for this idea to work. DeLong and Summers have introduced a topic that clearly merits future research.



Figure 1. Impulse Response Functions from Expectational VAR

Source: Discussant's estimates based on the expectational VAR described in the text. The sample is quarterly from 1939 through 2008. The dotted lines denote 95 percent confidence intervals based on bootstrap standard errors.





Source: Discussant's estimates based on the Blanchard-Perotti SVAR described in the text. The sample is quarterly from 1939 through 2008. The dotted lines denote 95 percent confidence intervals based on bootstrap standard errors.





Source: Interest rates are from the NBER Macrohistory Database, series 13029b (available at nber.org). Data originally from the Federal Reserve Board. The unemployment rate is constructed from monthly series on the number unemployed (including emergency workers) and the number employed. Underlying data from the NBER Macrohistory database, the Conference Board, and the Survey of Current Business were seasonally adjusted, scaled to match Weir's annual unemployment series and then spliced.





B. 2000 through 2012 ß Country A Country B

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