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The government spending multiplier: Evidence from county level data

Christopher A. Erickson*, Victor Owusu-Nantwi, Fred Owensby

Department of Economic, Applied Statistics, and International Business, College of Business, New Mexico State University, Box 30001, MSC 3CQ, Las Cruces, NM 88003, USA

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ABSTRACT

The passage of the American Recovery and Reinvestment Act (ARRA) of 2009 has brought fiscal policy to the forefront once again. The size of the "multiplier" of government spending becomes of critical importance for determining the effect of stimulus programs. Yet there is considerable controversy about this issue. This study adds to the discussion on the size of the multiplier by using earnings data by county. This allows the creation of a panel data that includes 3141 counties for the time period 2001–2012. We estimate the federal government spending multiplier to be approximate 1.5. Our estimate for state and local spending multipliers are considerably smaller. Our results have implication for policy in that federal programs will be more effective for stabilization county economies than state or local spending.

1. Introduction

When the Obama administration came into office in 2009, the U.S. economy was suffering the most severe recession since the Great Depression, more than 70 years prior. Real GDP was falling at a six percent annual rate and the Fed funds rate had reached the zero lower bound, sharply reducing the effectiveness of further monetary easing (Parker, 2011). The Obama administration proposed a stimulus package consisting of federal tax cuts, increased transfer payments to individuals, and increased government spending, which came to be known as the American Recovery and Reinvestment Act of 2009 (ARRA). The size of the "multiplier" for government spending becomes of critical importance for determining the effectiveness of ARRA. On one hand, a government spending multiplier larger than 1 implies that government spending both increases output directly and also stimulates the private sector activity. A multiplier of less than 1, on the other hand, indicates that private sector crowding out is occurring. The government's estimate of the impact of ARRA, for example, was calculated using a relatively large multiplier of 1.6 (Romer & Bernstein, 2009). Other studies argue for a much smaller multiplier (e.g., Nakamura & Steinsson, 2014). Still other studies argue that the size of the multiplier is contingent on the status of the economy—larger in periods of recession, when idle resources are plentiful, and smaller in periods of boom, when unemployed resources are scarce (Auerbach & Gorodnichenko, 2011).

The primary purpose of ARRA was to save and create jobs in the face of the 2008 financial crisis. The approximate cost of the economic stimulus package was estimated at $831 billion between 2009 and 2019 (CBO, 2012), with 90% of the expenditure occurring by the end of 2012. The Act is a complex mix of policies that included direct spending on infrastructure, education, health, and energy; federal tax incentives; and expansion of unemployment benefits and other social welfare programs. It also includes grants to state governments, which were designated for maintenance of state programs that otherwise would have to be

* Corresponding author. Tel.: +1 5756806098.
E-mail address: chrerick@nmsu.edu (C.A. Erickson).

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cut. The impact of different programs within ARRA is likely to vary depending on the exact nature of the provision. Programs that affect disposable income, such as cuts in personal income tax rates or increases in TANF payments, will have less impact than will direct expenditures by the government; one time cash payments will have less impact on household purchases than longer lasting changes; and cuts in corporate taxes on income generated from installed capital is likely to have less impact than policies that affect the return to future investment (CBO, 2012).

The controversy around implementation of ARRA makes clear the importance of understanding the effect of government spending on GDP. The present study contributes to this discussion by estimating the impact of government expenditure on the local economy by exploiting county level data to create a data set with 30,000 observations over 3141 counties for the years 2001–2012. The findings indicate the federal government spending multiplier is significant and greater than 1, with point estimates of around 1.5.

2. Literature review

The empirical evidence as to the size of multiplier is mixed. Barro (1981) finds a multiplier of .8 while Ramey (2011) finds a multiplier of 1.2. Hall (1986), using annual data going back to 1920, finds a slightly negative effect of government purchases on consumption. CBO estimates the multiplier associated with different provisions of ARRA to vary between highest for purchases of goods and services by the federal government with an estimated multiplier between 0.5 and 2.5, to lowest for corporate income tax cuts at 0–.40.[1] Ilzetzki, Mendoza, and Vegh (2013), using a data set for 44 countries, find the size of multiplier depends critically on key country-level characteristics: the multiplier is largest for industrial countries with fixed exchange rates and modest government debt, but zero for countries with flexible exchange rates and negative for high debt countries. An important determinant of the empirical multiplier is the treatment of the timing of the effect of government spending. The traditional assumption is that the effect of spending occurs in the quarter in which the spending occurs. Others, especially Ramey (2011) and Romer and Romer (2010), argue that the impact of government spending occurs at the time of announcement, which they study by analyzing news reports to determine when positive Congressional action is expected.

Studies assuming the effects of government spending are simultaneous with the actual expenditure of spending typically find positive government spending results in increased GDP, hours worked, consumption, and real wages (Blanchard & Perotti, 2002; Caldara & Kamps, 2008; Fatas & Mihov, 2001; Gali, David Lopez-Salido, & Valles, 2007; Monacelli & Perotti, 2008; Perotti, 2005; Rotemberg & Woodford, 1992; Barro & Redlick 2011). By contrast, studies assuming that government spending affects the economy via an announcement effect find that while government spending raises GDP and hours, it lowers consumption and the real wage (Burnside, Eichenbaum, & Fisher, 2004; Cavallo, 2005; Edelberg, Eichenbaum, & Fisher, 1999; Ramey & Shapiro, 1998; Romer & Romer, 2010). Papers investigating an announcement effect using event study methodology generally show a negative effect of government spending on private consumption (Cullen & Fishback, 2006; Giavazzi & Pagano, 1990).

The ambiguous results found in the empirical literature are reflected in published theoretical models, which fall into two general categories: neoclassical models that assume markets clear, and new Keynesian models that assume sticky prices. With neoclassical models such as those of Aiyagari, Christiano, and Eichenbaum (1992) and Baxter and King (1993), a permanent increase in government spending financed by non-distortionary means, such as a lump sum tax, creates a negative wealth effect. Households respond by decreasing consumption and increasing labor supply, causing output to rise. Increased labor supply causes the real wage to fall and a rise in the real return to capital in the short run. A higher real return causes capital accumulation, which ultimately causes the real wage to return to its original value. At the new steady state, consumption is lower and hours worked are higher. The neoclassical model is at odds with the empirical results of studies using contemporaneous timing rather than announcement effects.

The new Keynesian approach, characterized by price frictions in the short run, seeks to explain a rise in consumption, the real wage, and productivity found in most empirical analyses. For example, Drautzburg and Uhlig (2011), Rotemberg and Woodford (1992) and Devereux, Head and Lapham (1996) use models with imperfect competition and increasing returns to explain the rise in real wages and productivity. Gali et al. (2007) showed that only an ultra-Keynesian model can explain how consumption and real wages can rise when government spending increases, thereby highlighting the many special features required to explain a positive correlation between consumption and government spending. Typically, new Keynesian models are neoclassical in nature in the long run; therefore, long-run issues tend to be of second order in importance compared to the controversy over short run dynamics.

3. Methodology

Clearly, economists have no consensus theory for evaluating the macroeconomic effects of government spending, leaving the question open for empirical study. To assess the empirical effects of federal government spending, following Nakamura and Steinsson (2014), the following equation is estimated:

$$\frac{y(i,t)-y(i,t-1)}{y(i,t-1)} = \alpha_i + \gamma_t + \beta_1 \frac{g(i,t)-g(i,t-1)}{y(i,t-1)} + \boldsymbol{\beta}_2 \mathbf{z}(i,t) \qquad (1)$$

In the equation, i indicates county and t indicates time period; $y(.,.)$ is real earnings by place of work, which is the measure of economic activity; $g(.,.)$ is a vector of various measures of real federal government expenditures; $\mathbf{z}(.,.)$ is a vector of county level controls for year t; and α_i and γ_t are county and time fixed effects. The inclusion of county specific fixed effects allows for local trends in

[1] See CBO, 2012, Table 2, pp. 6–7.