University of Southern California
Graduate School of Business Administration

GSBA 526/549

**Notes on the Government Sector**

Thus far we have examined two sources of aggregate demand (consumption and investment). Now we examine government purchases of goods and services. In dealing with government purchases, the main question is how these purchases affect the economy in the long run and over the business cycle. An important question concerning other components of aggregated demand is how they respond to various economic shocks. In other words, we treat government purchases as exogenous (determined outside our model) and ask how they affect other economic variables, whereas consumption, investment, and net exports are endogenous (determined inside our model) and we ask how they respond to various economic shocks.

To keep things simple, we assume that the government finances its purchases in each period by levying lump-sum taxes on households. With a lump-sum tax, a household's tax liability is unaffected by changes in the household's behavior (such as earning more income or consuming more). Thus, a tax increase merely reduces the household's lifetime resources but exerts no substitution effects. We defer consideration of distorting taxes (those which have substitution effects) and government borrowing until later in the course.

Changes in government purchases of goods and services are economic shocks that affect aggregate demand and supply. We will concentrate on three such effects. First, an increase in government purchases causes a direct increase in aggregate demand. Second, by increasing household tax liability, the corresponding tax increase reduces after-tax income and thus consumption demand. Finally, the government may use its purchases to provide public services (e.g., roads, harbors, airports, enforcement of contracts, and protection of property rights) that increase the output of the private sector.

We assume that government purchases are exogenous. In particular, they do not depend on the interest rate. Just as with previously examined shocks, we consider both permanent and temporary changes in government purchases.

*Permanent Government Purchases*. Suppose that households establish a government which purchases goods and services equal to $G_t$ each period. For the moment, assume government activities have no effect on the private sector's production function. The direct effect of these purchases is to increase aggregate demand by $G_t$ permanently. However, because the government must collect an equal amount of taxes each period, households' disposable income falls by $G_t$. Because these taxes are collected each period, they constitute a reduction in permanent income. Thus, consumption demand is reduced by roughly $G_t$ each period, and saving is unaffected. The reduction in consumption demand offsets the increase in government purchases, leaving aggregate demand unaffected. Because aggregate supply is also unaffected, the permanent increase in government purchases has no effect on output. Because aggregate saving and investment are unaffected, the interest rate does not change. If government services are unproductive at the margin, the net effect of a permanent increase in the size of government is to reallocate resources from the private sector to the public sector, with no effect on total production or interest rates.

Now suppose that government uses each dollar of purchases to provide public services that increase the output of the private sector by an amount $\beta$. We will assume that $\beta$ is a constant and is less than unity, although $\beta$ may be greater than unity at low levels of government purchases and fall as the size of government increases (i.e., there may be diminishing marginal returns to increased government services). Permanent government purchases of $G_t$ increase output by $\beta G_t$ in every period. Households gain this extra income but must pay taxes of $G_t$ every period. Thus, their permanent income and consumption both fall by $(1-\beta)G_t$, and saving is unaffected. Subtracting this decrease in consumption demand from the increase in government purchases leaves a net increase in aggregate demand of $\beta G_t$. Because aggregate demand and supply both increase by the same amount $(\beta G_t)$, output also increases by $\beta G_t$. Because aggregate saving and investment are unaffected, the interest rate does not change.[1] If $\beta$ is a positive fraction, the net effect of an increase in government purchases is to increase total output but to reduce private consumption.

*Temporary Government Purchases*. Now suppose that government increases its purchases by $\Delta G_t$ during the current period only, after which purchases return to their normal level. Also suppose that these purchases have no effect on the private sector's production function.[2] Current household tax payments rise by $\Delta G_t$. Because the tax increase is temporary, it has little effect on permanent income or consumption. Aggregate saving falls by approximately $\Delta G_t$. Because investment demand is unchanged, the market clearing interest rate rises. Aggregate demand increases by $\Delta G_t$. If aggregate supply is not fixed but responds to the increase in aggregate demand, then output rises. Unlike permanent government purchases, temporary changes in purchases cause output and the interest rate to move in the same direction, tending to make interest rates procyclical. Keynesian economists emphasize these output effects of government purchases, recommending increases in government spending to stimulate aggregate demand and counteract recessions, even if the increased government spending is not directly productive. As we have seen, however, only temporary government purchases will have the desired effect. Permanent increases in unproductive government purchases merely reallocate resources from the private sector to the government. Only government services that are in some way productive will result in a permanent increase in output.

---

[1] We have implicitly assumed that the effect of government services on the private sector's production function does not affect the MPK and thus does not shift the investment demand curve. Government services might increase the productivity of some types of private capital and reduce the productivity of other types. For example, public roads might increase the productivity of private investment in trucks while reducing the productivity of private investment in roads. We have no way of knowing which effect dominates. At any rate, the long-run growth model implies that there is no long-run effect on the interest rate even if the investment demand curve shifts.

[2] Alternatively, we could assume that the increase in private productivity is spread over many periods, with very little occurring during the period when the government temporarily increases its purchases. This assumption would be reasonable for government investment projects such as roads. Empirically, most temporary government spending is associated with wars, and such spending probably has little contemporaneous effect on private production functions.