

Chapter 10

Supply-Side Economics

The backward-bending labor supply curve of the consumption-leisure model is one basis for a school of macroeconomic policy thought known as “supply-side economics.”⁶⁶ Its basic premise is that tax cuts would unlock a tremendous increase in the quantity supplied of productive resources (labor and capital) to the economy, thereby dramatically raising GDP. In this section, we will focus on the theoretical mechanism by which it may do so and also discuss the practical problems with such policies.

Taxes and the Backward-Bending Labor Supply Curve

Recall the basic backward-bending labor supply curve of the consumption-leisure model, reproduced in **Figure 48**, which we derived using the underlying indifference curves and budget constraint of the individual. Recall that the labor tax rate t explicitly appears in the budget constraint of the model,

$$Pc + (1-t)W(1-l) = (1-t)W.$$

If we hold the price of consumption P and the pre-tax wage rate W constant, then changes in the tax rate t clearly lead to changes in the slope of the budget constraint and hence to changes in the optimal choice of consumption and leisure. Such is the way that we traced out the backward-bending labor supply curve.

The claims of supply-side economies lies hinges on the assumption that the economy is usually in the upward-sloping portion of the labor supply curve, somewhere near n_1 or n_4 , say – the region in which increases in the after-tax wage would lead to a higher quantity of labor supplied. Thus, if the government were to lower the tax rate t , then the real after-tax wage rate $((1-t)W/P)$ would rise (with P held constant).

⁶⁶ This school of thought rose to policy prominence during the Reagan Administration and is generally associated with the Republican Party, though even within it is often viewed as an extreme set of positions. Recently, the economic policy advisers of the current George Bush have been essentially leaning again towards “supply-side” views. For an interesting (and scathing) review of the rise of the supply-siders during the 1970’s and 1980’s, see *Peddling Prosperity* by Paul Krugman.

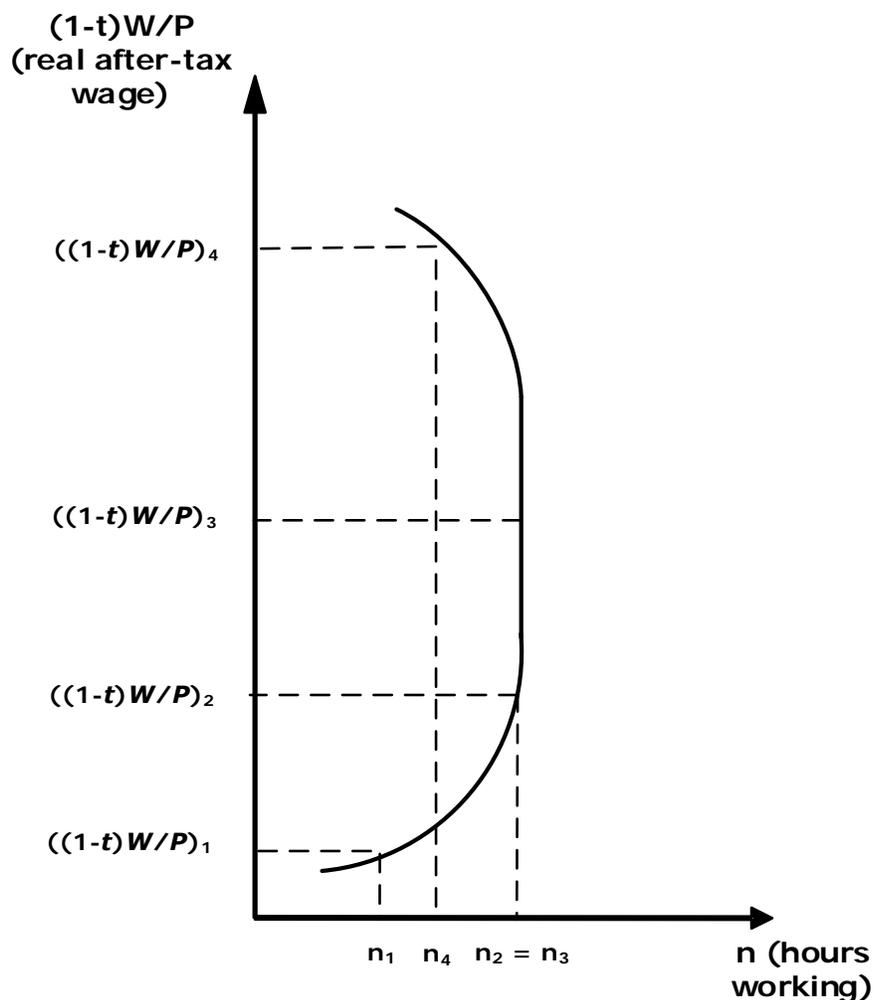


Figure 48. The backward-bending aggregate labor supply curve. According to the supply-side view, reductions in tax rates will cause individuals to increase their hours of work – implying that the economy must be in the upward-sloping region of the aggregate labor supply curve.

The resulting increase in quantity of labor supplied⁶⁷ would thus shift the aggregate supply function outwards because at any given price P firms could now produce more because they would be using more hours of labor. Note carefully that we would get a shift of the entire aggregate supply function, rather than just a movement along it, because the tax rate t does **not** appear on the axes of the aggregate supply graph, as shown in **Figure 49**.

⁶⁷ For simplicity, the labor demand curve is omitted from **Figure 48**. The more precise mechanism is that at a higher real after-tax wage, individuals demand more consumption. This extra consumption must be produced by firms. To produce more goods, firms will have to hire more labor, causing the labor demand curve (a derived demand) to shift out, which results in a movement along the labor supply curve in **Figure 48**.

Regardless of whether the supply-side claim that the economy is in the upward-sloping region of the labor supply curve is correct, it is the case that the consumption demand function shifts out, and hence the aggregate demand function shifts out, when the tax rate falls. We can see this simply by referring to the underlying indifference curve-budget line diagrams – a fall in t leads to a steeper budget line in the consumption-leisure model, and the new optimal choice features higher consumption. That is, even though P was held constant, a fall in t leads to a rise in the optimal choice of consumption. Thus, at any given price P , consumption is higher – which is precisely what it means for the consumption demand function to shift outwards, in turn causing the aggregate demand function to shift out.

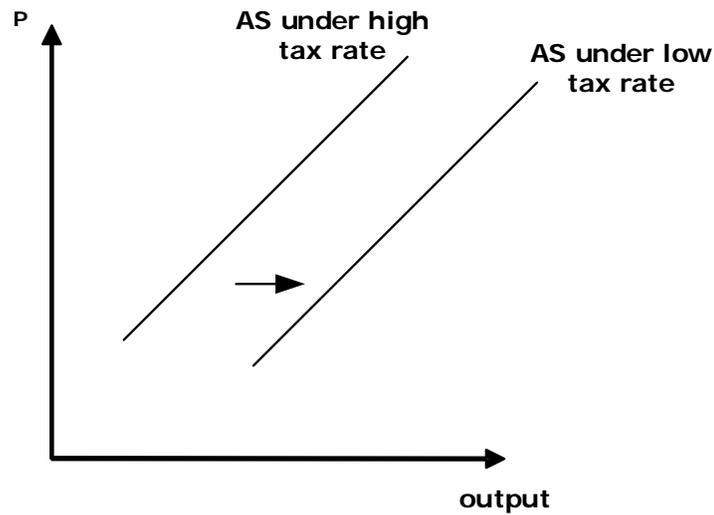


Figure 49. According to the supply-side view, reductions in tax rates will shift the aggregate supply function outwards because individuals will choose to increase their total number of work hours.

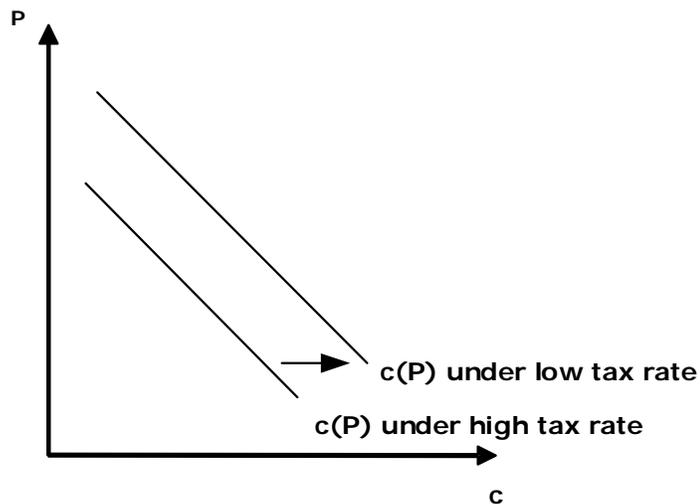


Figure 50. The consumption demand (which should be considered as a proxy for aggregate goods demand) function shifts outward due to a reduction in the tax rate.

The shift out of the consumption demand function is shown in **Figure 50**. Note that this effect is **not** a supply-side effect – this is our familiar result that demand rises when taxes fall. The supply-side effect is that depicted in **Figure 49**.

Figure 51 puts together the effects on aggregate demand and aggregate supply of a tax cut in the supply-side view. Clearly, GDP rises more than if aggregate supply did not shift, and the price level rises by less than if aggregate supply did not shift. Thus, under the supply-side view, tax cuts help boost economic growth and dampen inflation – seemingly the best of all possible scenarios.

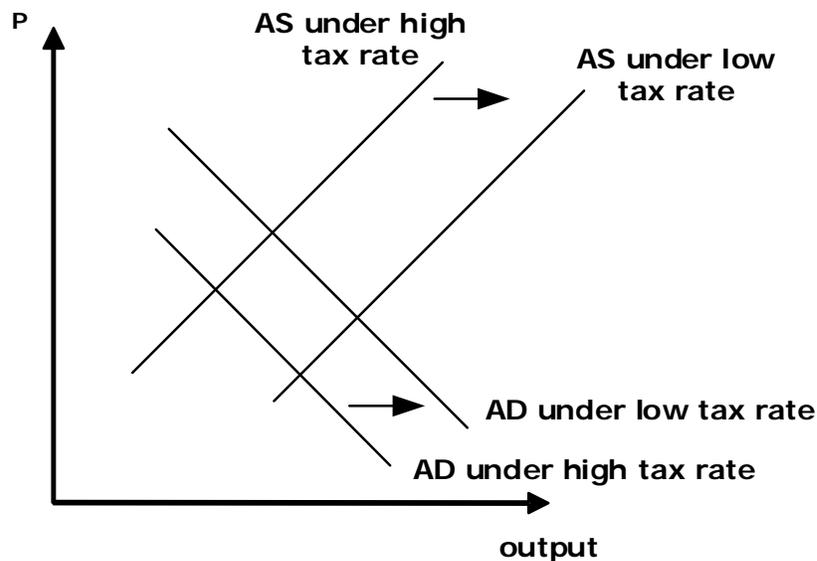


Figure 51. When the tax rate falls, the aggregate demand function shifts out. According to the supply-side view, the aggregate supply function also shifts out. The resulting rise in GDP is thus much higher under the supply-side view, while the resulting rise in inflation is lower under the supply-side view.

The Laffer Curve

A potential criticism of supply-side policies is that the tax-cutting they advocate will reduce government tax revenue (the total it collects in taxes), hence causing (or worsening) government budget deficits if the government does not simultaneously reduce its spending. However, the supply-side response is that in fact government tax revenues will **increase** if tax rates are reduced. Again, the backward-bending labor supply curve is used to justify their position.

Total tax revenues collected from wage taxes is the multiplicative product of the tax rate and number of hours worked in total in the economy. That is,

$$\text{Total tax revenue} = t \cdot n,$$

so that total revenue is directly proportional to the tax rate.⁶⁸ Thus it would seem that as t falls so must total tax revenue. But according to the supply-side view, the economy is in the upward-sloping region of the labor-supply curve. Thus, a fall in t induces a rise in n , and obviously if the rise in n is large enough to compensate for the fall in t , then total tax revenue may be unaffected or actually increase when the tax rate falls. This is exactly the argument that supply-siders make. This argument was made famous by Arthur Laffer, President Reagan's first chief economic adviser, in his **Laffer Curve**, shown in **Figure 52**.

Total tax revenue

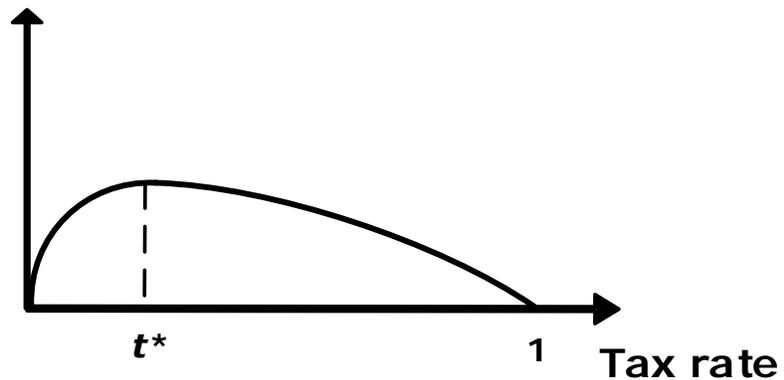


Figure 52. The Laffer Curve shows that total tax revenue is maximized at some tax rate t^* . Beyond t^* , total tax revenue falls as the incentive to work is reduced, to the point that at a tax rate 100% ($t = 1$), there is no incentive to work at all, so that $n = 0$ and total tax revenue equals zero. The supply-side view is that the economy is to the right of t^* on the Laffer Curve, so that reductions in tax rates would boost total revenue.

The Laffer Curve shows that total tax revenues are zero at two points, at $t = 0$ and $t = 1$. A zero tax rate clearly leads to zero tax revenue because the government is simply not taxing individuals at all. But a 100% tax rate also leads to zero tax revenue simply because there would be no incentive to work at all – that is, if the government levied a 100% tax rate, then $n = 0$ so that again tax revenues are zero. The fact that this function hits zero at two points and the observation that intermediate tax rates do lead to strictly

⁶⁸ When considering optimal tax policy, we will be more precise about the n term. Technically, as per the consumption-leisure analysis, n – that is, optimal labor supply – depends on the tax rate t .

positive tax revenues indicates that there must be some tax rate, called t^* in **Figure 52**, at which total tax revenue is maximized. The argument of supply-siders is that the economy is to the right of t^* , so that cutting tax rates would boost total tax revenues and refuting the argument that the government budget deficit would worsen.

Limitations of Supply-Side Policies

As a theoretical proposition, the supply-side view seems quite appealing: tax cuts for workers, faster economic growth, and lower inflation. Indeed, a panacea for all macroeconomic ills with little or no cost, if only policy-makers were willing to listen to this very simple advice! However, there is a major practical problem with the supply-side claims, and it is purely an empirical one. The argument rests on the economy being on the upward-sloping arm of the aggregate labor supply curve. Moreover, the labor supply curve must be quite flat (elastic) in this region so that the quantity of labor supplied increases dramatically when the real after-tax wage rate falls.

The problem is that empirical evidence, and actual policy results, do not support these empirical requirements of supply-side theory. It is true that microeconomic evidence supports the backward-bending labor supply curve at an individual level. Summing horizontally all individuals' labor supply curves suggests that the aggregate labor supply curve is also backward-bending. But at a macroeconomic level, it appears that the economy is usually in the nearly-vertical region of the labor supply curve. In terms of **Figure 48**, it appears that the economy is generally between $((1-t)W/P)_2$ and $((1-t)W/P)_3$, a region in which total hours worked is simply not very responsive to changes in the real after-tax wage rate and hence not very responsive to tax cuts.⁶⁹

The tax-cutting policies implemented under Reagan did in fact lead to lower tax revenues in the 1980s, suggesting that the economy was on the left side of t^* on the Laffer Curve. Furthermore, there is no evidence that economic growth was faster as a result of such policies. Our final conclusion, then, is that supply-side policies in theory seem appealing, but in practice do not seem to deliver all they promise. But debate amongst conservative and liberal economists and politicians continues to rage on this subject

⁶⁹ This finding suggests that the "average person" in the U.S. is "middle-class" in the sense that he earns a wage which is neither very low nor very high.