# Lecture 9 - Redistributive Policies

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## Contents



## Introduction

From Keynes [1936]:

> Since the end of the nineteenth century significant progress towards the removal of very great disparities of wealth and income has been achieved through the instrument of direct taxation—income tax and surtax and death duties—especially in Great Britain. Many people would wish to see this process carried much further, but they are deterred by two considerations; partly by the fear of making skilful evasions too much worth while and also of diminishing unduly the motive towards risk-taking, but mainly, I think, by the belief that the growth of capital depends upon the strength of the motive towards individual saving and that for a large proportion of this growth we are dependent on the savings of the rich out of their superfluity. Our argument does not affect the first of these considerations. But it may considerably modify our attitude towards the second. For we have seen that, up to the point where full employment prevails, the growth of capital depends not at all on a low propensity to consume but is, on the contrary, held back by it; and only in conditions of full employment is a low propensity to consume conducive to the growth of capital. Moreover, experience suggests that in existing conditions saving by institutions and through sinking funds is more than adequate, and that measures for the redistribution of incomes in a way likely to raise the propensity to consume may prove positively favourable to the growth of capital.
>
> The State will have to exercise a guiding influence on the propensity to consume partly through its scheme of taxation. (. . . ) Whilst, therefore, the enlargement of the functions of government, involved in the task of adjusting to one another the propensity to consume and the inducement to invest, would seem to a nineteenth-century publicist or to a contemporary American financier to be a terrific encroachment on individualism, I defend it, on the contrary, both as the only practicable means of avoiding the destruction of existing economic forms in their entirety and as the condition of the successful functioning of individual initiative.

# 1 Redistributive Policies

According to neoclassical economics, income taxation must strike a balance between equity and efficiency. Redistributing income leads to efficiency losses, as it dimishes workers' incentives to produce income in the first place. Income redistribution leads to lower output, but also to output that is distributed more equally. According to the first welfare theorem, a market economy leads to a Pareto optimal outcome: it is impossible to make someone better off without making someone else worse off. This basic equity-efficiency trade-off is pervasive in the political debate and underlies much of modern public economics, following Mirrlees [1971].

However, Keynesian economics provides a mechanism through which more redistribution might actually increase output overall, at the same time as it reduces inequality. The idea that the economy suffers from a shortage of aggregate demand coming from increases in inequality has been put forward recently by mainstream academics such as Raghuram Rajan, former chief economist of the IMF, and now governor at the Bank of England (Rajan [2010]), as well as by Robert Reich, US Secretary of Labor from 1993 to 1997 (**?**). This was noted by Minsky [1976]: "Although class ideas with respect to consumption are alluded to in The General Theory, and although class income affects the saving propensities in the work of Keynesian economists, such as N. Kaldor and J. Robinson, in general in the mainstream Keynesian literature the law for the determination of the surplus (i.e., the consumption function) treats income as a homogeneous glob in determining consumption behavior."

A small modification of the goods market model underlying lecture 7 and lecture 8 allow to make sense of this hypothesis. It also suggests two potential policy prescriptions in this situation:

- Income redistribution, from high to low income earners.
- Debt-financed decreases in taxes, financed by public debt.

Instead of assuming one type of consumer, with the average income $Y$ and a given marginal propensity to consume $c_1$, we shall assume two types of workers:

- There is a fraction $\lambda$ of low income earners, who earn income $\underline{y}$, pay net taxes $\underline{t}$, and the MPC of the low income earners is $\underline{c}_1$:
$$\underline{c} = \underline{c}_0 + \underline{c}_1(\underline{y} - \underline{t}).$$
- There is a fraction $1-\lambda$ of high income earners, they get an income $\bar{y} = \gamma \underline{y}$, where $\gamma$ indexes inequality, pay net taxes $\bar{t}$, and the MPC of the high income earners is $\bar{c}_1 < \underline{c}_1$:
$$\bar{c} = \bar{c}_0 + \bar{c}_1(\bar{y} - \bar{t})$$

We have:

$$Y = \lambda \underline{y} + (1-\lambda)\gamma \underline{y} \quad \Rightarrow \quad \boxed{\underline{y} = \frac{1}{\lambda + (1-\lambda)\gamma} Y}$$
$$\boxed{\bar{y} = \gamma \underline{y} = \frac{\gamma}{\lambda + (1-\lambda)\gamma} Y}$$

The total income of the low income earners $\underline{Y}$ and the total income of the high income earners $\bar{Y}$ are such that:

$$\underline{Y} = \lambda \underline{y}, \qquad \bar{Y} = (1-\lambda)\bar{y}, \qquad \underline{Y} + \bar{Y} = Y$$
$$\underline{Y} = \frac{\lambda}{\lambda + (1-\lambda)\gamma} Y, \qquad \bar{Y} = \frac{(1-\lambda)\,\gamma}{\lambda + (1-\lambda)\gamma} Y.$$

Numerical Application: let's divide the population in two groups, the top 10% income share, and the bottom 90% income share, so that: $\lambda = 0.9$. Since the top 10% get approximately 50% of the income in the U.S., this implies that:

$$\frac{\lambda}{\lambda + (1-\lambda)\gamma} = 0.5 \quad \Rightarrow \quad \gamma = 9.$$

# 2 No Automatic Stabilizers

Assume that investment depends on output:

$$I = b_0 + b_1 Y$$

Total taxes are given by:

$$T = \lambda \underline{t} + (1-\lambda)\,\bar{t}.$$

Total taxes paid by the low income earners $\underline{T}$ and the total taxes paid by the high income earners $\bar{T}$ are such that:

$$\underline{T} = \lambda \underline{t}, \qquad \bar{T} = (1-\lambda)\,\bar{t}, \qquad \underline{T} + \bar{T} = T.$$

Total consumption by the low income earners $\underline{C}$ and total consumption by the high income earners $\bar{C}$ are such that:

$$\underline{C} = \lambda \underline{c} = \underline{C}_0 + \underline{c}_1\left(\underline{Y} - \underline{T}\right), \qquad \bar{C} = \lambda \bar{c} = \bar{C}_0 + \bar{c}_1\left(\bar{Y} - \bar{T}\right), \qquad \underline{C} + \bar{C} = C.$$

Total demand is then:

$$\begin{aligned}
Z &= C + I + G \\
&= \underline{C} + \bar{C} + b_0 + b_1 Y + G \\
&= \lambda \underline{c} + (1-\lambda)\bar{c} + b_0 + b_1 Y + G \\
&= \left[\lambda \underline{c}_0 + (1-\lambda)\,\bar{c}_0\right] + \left(\frac{\lambda \underline{c}_1 + (1-\lambda)\,\gamma \bar{c}_1}{\lambda + (1-\lambda)\gamma} + b_1\right) Y - \left[\lambda \underline{c}_1 \underline{t} + (1-\lambda)\,\bar{c}_1 \bar{t}\right] + b_0 + G \\
Z &= \left[\lambda \underline{c}_0 + (1-\lambda)\,\bar{c}_0\right] + \left(\frac{\lambda \underline{c}_1 + (1-\lambda)\,\gamma \bar{c}_1}{\lambda + (1-\lambda)\gamma} + b_1\right) Y - \left[\underline{c}_1 \underline{T} + \bar{c}_1 \bar{T}\right] + b_0 + G.
\end{aligned}$$

Define the average marginal propensity to consume as:

$$\boxed{c_1 = \frac{\lambda \underline{c}_1 + (1-\lambda)\,\gamma \bar{c}_1}{\lambda + (1-\lambda)\gamma}}.$$

Define the baseline level of consumption as:

$$c_0 = \lambda \underline{c}_0 + (1-\lambda)\,\bar{c}_0$$

Equating output to demand Z=Y gives the value for output:

$$\boxed{Y = \underbrace{\frac{1}{1 - c_1 - b_1}}_{\text{Multiplier}} \underbrace{\left[c_0 - \left(\underline{c}_1 \underline{T} + \bar{c}_1 \bar{T}\right) + b_0 + G\right]}_{\text{Autonomous Spending } z_0}}.$$

## 2.1 Income redistribution from high income to low income earners

Assume a budget neutral change in net taxes. Assume that transfers to the low income earners are increased, so that $\Delta \underline{T} < 0$, so that aggregate net taxes stay constant $\Delta T = 0$. Therefore, taxes on the high income earners are increased at the same time with $\Delta \bar{T} = -\Delta \underline{T} > 0$. This leads to a change in autonomous spending:

$$\Delta z_0 = -\underline{c}_1 \Delta \underline{T} - \bar{c}_1 \Delta \bar{T} \quad \Rightarrow \quad \Delta z_0 = \left(\underline{c}_1 - \bar{c}_1\right) \Delta \bar{T} > 0.$$

This impulse leads to an increase in output:

$$\boxed{\Delta Y = \frac{\underline{c}_1 - \bar{c}_1}{1 - c_1 - b_1} \Delta \bar{T}}.$$

### 2.2 Debt-financed tax cuts for high income earners

Assume tax cuts for high income earners $\Delta\bar{T} < 0$, then output increases:

$$\Delta Y = -\frac{\bar{c}_1}{1 - c_1 - b_1}\Delta\bar{T} > 0.$$

There is an increase in output and a government deficit.

### 2.3 Debt-financed tax cuts for the low income earners

Assume tax cuts for low income earners $\Delta\underline{T} < 0$, then output increases:

$$\Delta Y = -\frac{\underline{c}_1}{1 - c_1 - b_1}\Delta\underline{T} > 0.$$

There is an increase in output and a government deficit.

## 3 Automatic Stabilizers

Instead of assuming that taxes are fixed, we now assume that taxes depend on output, both for low income earners:

$$\underline{t} = \underline{t}_0 + \underline{t}_1\underline{y}$$

as well as for high income earners:

$$\bar{t} = \bar{t}_0 + \bar{t}_1\bar{y}.$$

Taxes paid by the low income earners $\underline{T}_0$ and taxes paid by the high income earners $\bar{T}_0$ are such that:

$$\underline{T}_0 = \lambda\underline{t}_0, \qquad \bar{T}_0 = (1-\lambda)\,\bar{t}_0, \qquad \underline{T}_0 + \bar{T}_0 = T_0.$$

Total taxes are given by:

$$T = \lambda\underline{t} + (1-\lambda)\,\bar{t},$$

which, as a function of total income, is:

$$\boxed{T = \left(\underline{T}_0 + \bar{T}_0\right) + \frac{\lambda\underline{t}_1 + (1-\lambda)\,\gamma\bar{t}_1}{\lambda + (1-\lambda)\gamma}Y}.$$

Total demand is then:

$$\begin{aligned}
Z &= C + I + G \\
&= \lambda\underline{c} + (1-\lambda)\bar{c} + b_0 + b_1 Y + G \\
Z &= [\lambda\underline{c}_0 + (1-\lambda)\,\bar{c}_0] + \left(\frac{\lambda\underline{c}_1 + (1-\lambda)\,\gamma\bar{c}_1}{\lambda + (1-\lambda)\gamma} + b_1\right)Y - \left[\lambda\underline{c}_1\underline{t} + (1-\lambda)\,\bar{c}_1\bar{t}\right] + b_0 + G
\end{aligned}$$

We have:

$$\lambda\underline{c}_1\underline{t} + (1-\lambda)\,\bar{c}_1\bar{t} = \left(\lambda\underline{c}_1\underline{t}_0 + (1-\lambda)\,\bar{c}_1\bar{t}_0\right) + \frac{\lambda\underline{c}_1\underline{t}_1 + (1-\lambda)\,\gamma\bar{c}_1\bar{t}_1}{\lambda + (1-\lambda)\gamma}Y.$$

Therefore:

$$Z = [\lambda \underline{c}_0 + (1-\lambda)\bar{c}_0] + \frac{\lambda \underline{c}_1 + (1-\lambda)\gamma \bar{c}_1}{\lambda + (1-\lambda)\gamma} Y - \left[\lambda \underline{c}_1 \underline{t} + (1-\lambda)\bar{c}_1 \bar{t}\right] + b_0 + G$$

$$Z = \left[\lambda\left(\underline{c}_0 - \underline{c}_1 \underline{t}_0\right) + (1-\lambda)\left(\bar{c}_0 - \bar{c}_1 \bar{t}_0\right)\right] + \left(\frac{\lambda\left(1-\underline{t}_1\right)\underline{c}_1 + (1-\lambda)\gamma\left(1-\bar{t}_1\right)\bar{c}_1}{\lambda + (1-\lambda)\gamma} + b_1\right) Y + b_0 + G$$

The average marginal propensity to consume is given by:

$$\boxed{(1-t_1)\,c_1 = \frac{\lambda\left(1-\underline{t}_1\right)\underline{c}_1 + (1-\lambda)\gamma\left(1-\bar{t}_1\right)\bar{c}_1}{\lambda + (1-\lambda)\gamma}}.$$

Equating output to demand $Z = Y$ gives the value for output:

$$\boxed{Y = \underbrace{\frac{1}{1-(1-t_1)\,c_1 - b_1}}_{\text{Multiplier}} \underbrace{\left[(\lambda \underline{c}_0 + (1-\lambda)\bar{c}_0) - \underline{c}_1 \underline{T}_0 - \bar{c}_1 \bar{T}_0 + b_0 + G\right]}_{\text{Autonomous Spending } z_0}}.$$

## 3.1 Income redistribution from high income to low income earners

Assume a change in net taxes such that. Assume that transfers to the low income earners are increased, so that $\Delta \underline{T}_0 < 0$, so that $\Delta \underline{T}_0 + \Delta \bar{T}_0 = 0$. Therefore, taxes on the high income earners are increased at the same time with $\Delta \bar{T}_0 = -\Delta \underline{T}_0 > 0$. This leads to a change in autonomous spending:

$$\Delta z_0 = -\underline{c}_1 \Delta \underline{T}_0 - \bar{c}_1 \Delta \bar{T}_0 \quad \Rightarrow \quad \Delta z_0 = \left(\underline{c}_1 - \bar{c}_1\right)\Delta \bar{T}_0 > 0.$$

This impulse leads to an increase in output:

$$\boxed{\Delta Y = \frac{\underline{c}_1 - \bar{c}_1}{1-(1-t_1)\,c_1 - b_1}\Delta \bar{T}_0 > 0}.$$

Using the value for aggregate taxes:

$$T = \left(\underline{T}_0 + \bar{T}_0\right) + \frac{\lambda \underline{t}_1 + (1-\lambda)\gamma \bar{t}_1}{\lambda + (1-\lambda)\gamma} Y.$$

$$\Delta T = \underbrace{\Delta \underline{T}_0 + \Delta \bar{T}_0}_{0} + \frac{\lambda \underline{t}_1 + (1-\lambda)\gamma \bar{t}_1}{\lambda + (1-\lambda)\gamma} \Delta Y.$$

Finally:

$$\Delta T = \frac{\lambda \underline{t}_1 + (1-\lambda)\gamma \bar{t}_1}{\lambda + (1-\lambda)\gamma} \frac{\underline{c}_1 - \bar{c}_1}{1-(1-t_1)\,c_1 - b_1}\Delta \bar{T}_0.$$

Thus, public saving increase, there is a reduction in the deficit, in public debt, and therefore:

$$\boxed{\Delta (T - G) = \frac{\lambda \underline{t}_1 + (1-\lambda)\gamma \bar{t}_1}{\lambda + (1-\lambda)\gamma} \frac{\underline{c}_1 - \bar{c}_1}{1-(1-t_1)\,c_1 - b_1}\Delta \bar{T}_0}$$

### 3.2 Debt-financed tax cuts for high income earners

Assume tax cuts for high income earners $\Delta\bar{T}_0 < 0$, then output increases:

$$\Delta Y = -\frac{\bar{c}_1}{1-(1-t_1)\,c_1 - b_1}\Delta\bar{T}_0 > 0.$$

The impact on aggregate taxes is however ambiguous:

$$\Delta T = \underbrace{\Delta\bar{T}_0}_{=0} + \Delta\underline{T}_0 + \frac{\lambda\underline{t}_1 + (1-\lambda)\,\gamma\bar{t}_1}{\lambda + (1-\lambda)\gamma}\Delta Y$$

$$\Delta T = \left(1 - \frac{\lambda\underline{t}_1 + (1-\lambda)\,\gamma\bar{t}_1}{\lambda + (1-\lambda)\gamma}\frac{\bar{c}_1}{1-(1-t_1)\,c_1 - b_1}\right)\Delta\bar{T}_0$$

Therefore, the impact on public saving is similarly ambiguous:

$$\boxed{\Delta\,(T-G) = \left(1 - \frac{\lambda\underline{t}_1 + (1-\lambda)\,\gamma\bar{t}_1}{\lambda + (1-\lambda)\gamma}\frac{\bar{c}_1}{1-(1-t_1)\,c_1 - b_1}\right)\Delta\bar{T}_0}$$

There is an increase in output and, depending on parameters, there can be a government surplus or a government deficit.

### 3.3 Debt-financed tax cuts for the low income earners

Assume tax cuts for low income earners $\Delta\underline{T}_0 < 0$, then output increases:

$$\Delta Y = -\frac{\underline{c}_1}{1-(1-t_1)\,c_1 - b_1}\Delta\underline{T}_0 > 0.$$

The impact on aggregate taxes is however ambiguous:

$$\Delta T = \Delta\underline{T}_0 + \underbrace{\Delta\bar{T}_0}_{=0} + \frac{\lambda\underline{t}_1 + (1-\lambda)\,\gamma\bar{t}_1}{\lambda + (1-\lambda)\gamma}\Delta Y$$

$$\Delta T = \left(1 - \frac{\lambda\underline{t}_1 + (1-\lambda)\,\gamma\bar{t}_1}{\lambda + (1-\lambda)\gamma}\frac{\underline{c}_1}{1-(1-t_1)\,c_1 - b_1}\right)\Delta\underline{T}_0$$

Therefore, the impact on public saving is similarly ambiguous:

$$\boxed{\Delta\,(T-G) = \left(1 - \frac{\lambda\underline{t}_1 + (1-\lambda)\,\gamma\bar{t}_1}{\lambda + (1-\lambda)\gamma}\frac{\underline{c}_1}{1-(1-t_1)\,c_1 - b_1}\right)\Delta\underline{T}_0}$$

There is an increase in output and, depending on parameters, there can be a government surplus or a government deficit.

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