Microeconomics: BSc Year One

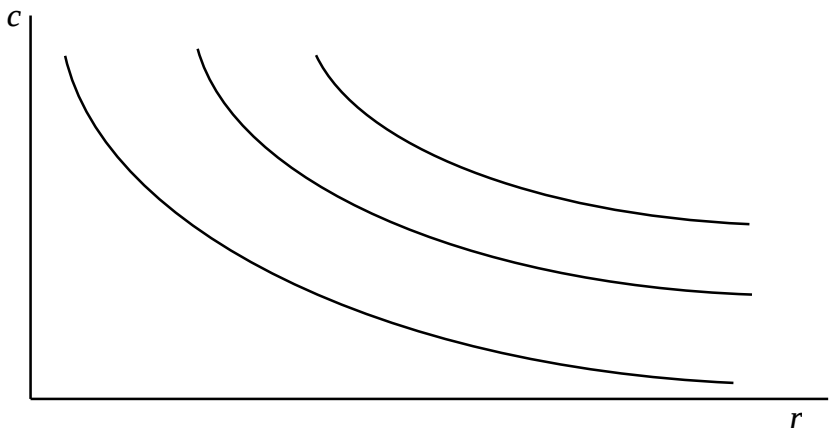
Labour Supply

The supply of labour can be looked at in a similar way to other microeconomic problems. People are effectively given an endowment of time, which they can trade for money. The incentive to work will then vary with many factors.

Assuming people can find a job, and can choose how many hours they work (by choosing full and part time work, or by choosing more than one job … an interesting point is why the working week is fixed at 40 hours, as employers should ask how much people wish to work), we base an individual's decisions between income and leisure (which includes anything the individual is not paid to do).

We must eventually allow for the intensity of the work, but for now we just look at wage rates for a general job, effectively preventing leisure.

The utility function is given by $\text{utility} = U(c,r)$, where c is consumption, and r is leisure time.



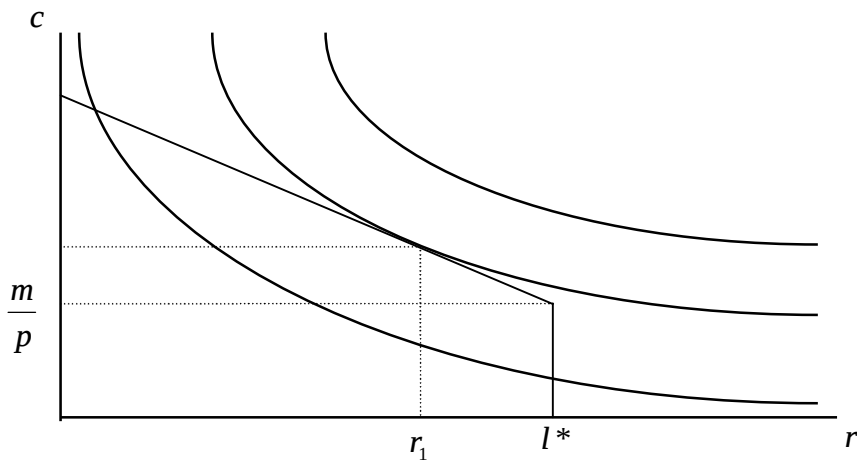
The budget line can be easily derived; given an endowment of l^* hours of time (24 hours a day), and m (an income independent of wage), and using p as the average price, w as the wage per hour, and l as the number of hours worked:

$$p \cdot c = m^* w \cdot l$$

or

$$p \cdot c + w \cdot r = m + w \cdot l^*.$$

Here $p \cdot c$ is the spending on consumer goods, $w \cdot r$ is the spending on leisure, and $(m + w \cdot l^*)$ is the full income. The budget line is thus kinked, and putting it together with the indifference curves, we get a diagram as follows:



If the non-wage income goes up, the budget line moves up, and the slope stays the same. If this income is higher, people will want to work less, since the intersection with the indifference curve will probably be further to the right.

An increase in wage swivels the budget line about the endowment point. The substitution effect makes leisure less profitable, meaning the individual will work more; but the income effect will mean spending on leisure is increased, and the individual will work less.

Over the last one hundred years, real wages have been rising. However, while from 1900 to 1950 hours of work per week were falling, from 1950 to 1990 the hours per week have been roughly constant, with each person being given more holidays and non-employed periods (in higher education and so on). Also, a higher proportion of the population is working.

For a shorter term, there is mixed evidence. The best results come from households; increases on one wage will lead to either a low rise in the hours of work for the main earner and falls for other earners, or a high rise in hours of work for the other earners.

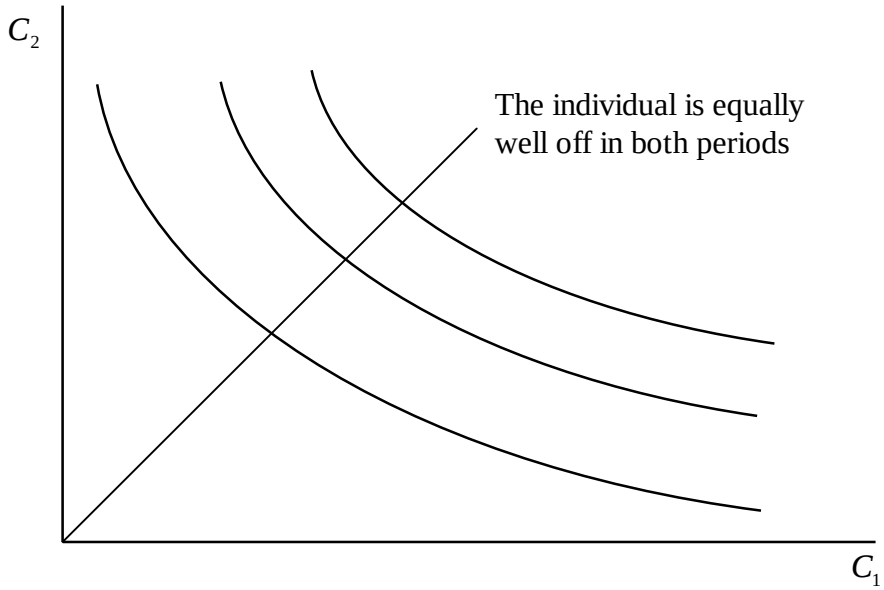
The effects of a proportional income tax (for example, all wages being reduced by 20%) is also important. Wage rates are not a significant factor, suggesting tax rates are not important. But taxes may pay for free services, leading to a lower incentive to work, and a non-proportional tax system will have different effects. A progressive tax system (where taxes rise with income) will rotate the budget line, providing less incentive to work longer hours.

Intemporal choice

We need to examine choices over time; people plan for the future, and thus save and borrow – these factors are important in macroeconomics. People save for the future, to ensure a steady

level of consumption, and for the returns from saving (when the saving is placed in a bank or building society account).

First consider a person over two time periods, who is certain of what will happen in the future. This individual has some preferences as to when they consume, and a standard indifference curve analysis can be used:



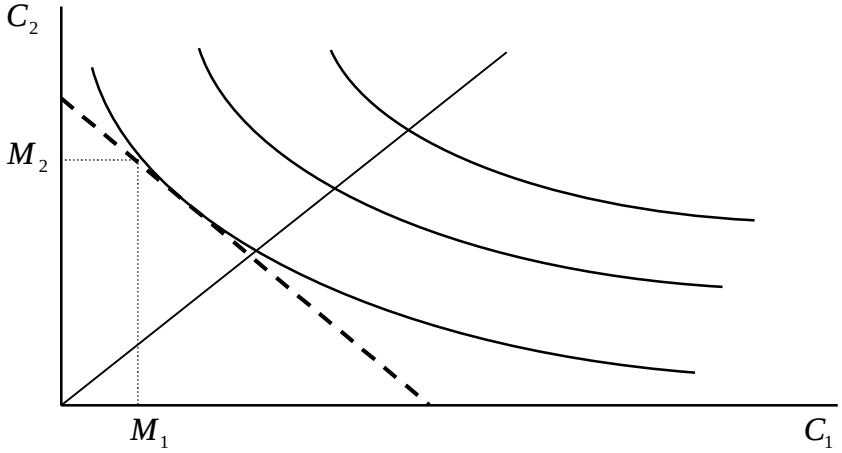
If people are indifferent between time periods (so there is no pure time preference), the indifference curves are symmetrical about the 45° line. Assume C is in money terms, and prices are constant. The incomes in the two periods are M_1 and M_2, and assume that people can borrow or lend at the interest rate r.

From this, we can state that $(M_1 - C_1)$ is the savings from period one, and $[M_2 + (M_1 - C_1) \cdot (1+r)]$ is what can be spent in period two. Here we ignore the possibility of leaving money for the future; we shall assume all income is spent eventually.

We can see that:

$$C_1 + \frac{C_2}{1+r} = M_1 + \frac{M_2}{1+r}$$

(in this equation, the left hand side is the 'present value of consumption' and the right hand side is the 'present value of income') and thus the budget constraint will look like the dashed line below, with slope equal to $-(1+r)$:



As stated above, the present value of income is $M_1 + \frac{M_2}{1+r}$. Given a choice between careers, an individual will try to maximise this value. However, in practise, an individual often can't borrow and save at the constant interest rate r, because of risk and profits made by lending institutions, and this brings difficulties into using present values.

For consumers, the marginal rate of substitution (MRS) between future and present consumption is equal to the slope of the budget line, equal to $-(1+r)$. Since r is the same across the economy, this is the same for all consumers.

A change in interest rates

Firstly, note that the point (M_1, M_2) remains stationary with a change in interest rates, as at this point the consumer neither borrows or lends and so is unaffected by variations in r.

Now, consider the case where interest rates rise. With a higher interest rate, future consumption becomes cheaper, so there is more incentive to save (the substitution effect).

If the consumer is initially a borrower (that is, the original budget constraint touches an indifference curve to the right of M_1, and thus below (M_1, M_2)), the income effect adds to the substitution effect to make C_1 fall (since borrowers are worse off by having to pay a higher interest rate). If the individual starts as a lender, the income effect acts in the opposite direction, increasing C_1 (since lenders are better off); it is unknown exactly what the total effect of income and substitution on C_1 will be, but C_2 will definitely rise.

In the UK, the personal sector is a net lender, so the total effect of interest rate changes is unknown.

Changes in income levels

Changes in one year's income should have little effect on consumption patterns, only altering lifetime incomes. It should be noted that the marginal propensity to consume (MPC) of extra income seems to be very high, possibly indicating an increase in M_2. The optimism of consumers with regard to future incomes is very important when running a forecasting model such as this.

There will also be a substitution between leisure in periods, depending on the temporary or permanent position of the increase in wage rates. A temporary wage increase leads to increased work, while a permanent wage increase has little effect on working patterns.