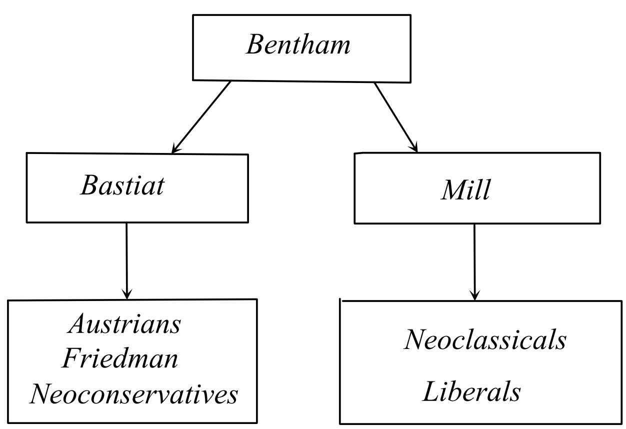
Lecture Note 7

John Stuart Mill

Most texts on the history of economics treat John Stuart Mill (1806–1873) as a figure of transition, being at the same time the last of the 'great' classical writers and an early (almost) marginalist. The overall assessment of Mill has changed over time, and he has had a certain revival after the writings of Chipman who read into Mill's treatment of Ricardo's trade model an early version of modern general equilibrium theory (see below).

A different angle is proposed by Hunt and Lautzenheiser, putting Mill into a more general framework and thereby placing him more firmly in the long sequence of development of economic thinking. The key concept here is **utilitarianism,** which origins in Bentham and which deeply influenced the thinking not only of Mill but also of other contemporary economists, notably Bastiat. But utilitarianism was treated in a very different way, and one may consider Bastiat and Mill as founders of different schools of utilitarianism, as shown in the figure. While Mill had a much better background and a more elaborated argumentation, Bastiat is more consistent in his reasoning.



The basic principles of utilitarianism, as formulated by Bentham, can be condensed to the following:

(1) All motives can be reduced to the self-interested quest for pleasure,

(2) Each person is the sole judge of his own pleasures, and therefore interpersonal comparisons of pleasure are impossible.

In Bentham's formulation, (2) means that if the quantity of pleasure is the same, pushpin is as good as poetry. Mill did not subscribe fully to either of them, he believed that nobler motives could motivate as well, and he definitely considered some pleasures morally superior to others. Here the difference to Bastiat is striking.

The wage fund theory was a fundamental part of the classical theory, based on the idea that capitalists needed to set aside the necessary means for sustaining the workers until the product became available for sale. According to e.g. Senior, the fixed size of the wage fund and the number of workers determine the wage rate, and any activity, such as that of trade unions, to change the wage rate would fail. Mill accepted a reformulated version of the wage fund theory but was less clearcut with respect to its implications and the possibility of changing wage rates.

The wage fund theory as exposed by the classicals depend on two central assumptions,

(1) an aggregate point-input–point-output production function (this is also known as the annual harvest assumption),
(2) output is composed of machinery, wage goods, and capitalist consumer goods (the wage good assumption).

Mill was relaxed about (1) and admitted that capitalists obtain their profits not once a year but spread over time. This has as consequence that the idea of a demand for labour with elasticity one must be abandoned. It there are many capitalists, each having a wage fund, then some of them may choose to postpone production if wages increase but are expected to return to the previous level later, and this may cause the elasticity to be above one. However, this does not contradict the wage fund theory as such.

It is more tricky if (2) is abandoned, so that capitalists and workers use the same type of goods. Suppose that the capitalist has a stock Y of goods to be used for wages or consumption,

$$Y = wL + c_1.$$

After the production period, output is aL, which again can be used for wages, wL', or for consumption c_2. If we assume that we are in a stable situation and capitalists want to return to it, we have that $L' = \frac{Y}{a}$, so that $c_2 = aL - w\frac{Y}{a}$ and

$$c_1 + c_2\frac{w}{a} = Y - wL + wL - Y\left(\frac{w}{a}\right)^2$$

or equivalently

$$c_1 + c_2(1 + r)^{-1} = Y - Y(1 + r)^{-2},$$

where we have introduced r, the profit rate, by $(1 + r) = \frac{a}{w}$. We have here a budget equation for the capitalist, and assuming utility maximization, the optimal choices of

c_1 and c_2 would usually be found where the indifference curves (in a c_1-c_2 diagram) are tangential to the budget line. If, however, we assume – in line with classical thinking – that there are fixed coefficients in the weighing of consumption today and tomorrow, typically so that they have equal weight, then indifference curves have a 90° kink whenever $c_1 = c_2$, so that the optimum will satisfy this condition. Inserting in this, we get

$$Y - wL = aL - w\frac{Y}{a}$$

and reorganizing, this gives us the equation $(Y - aL)w\left(1 + \frac{a}{w}\right) = 0$, which can be satisfied only if $Y = aL$, showing that the labour demand L is independent of w. Thus, a rise in w influences the budget constraint reducing consumption, so that the wage fund increases proportionally to the wage rate, and demand for labour is completely inelastic. This is of course a short-run story, but anyway the capitalist expects that the changes in the wage rate are temporary.

Say's law was upheld by Mill but again he is not quite outspoken about details. Assume that there are $l - 1$ commodities and money (the lth commodity). Then Walras' law (or Walras' identity) holds, that is

$$\sum_{h=1}^{l-1} p_h \zeta_h(p_1, \ldots, p_{l-1}) + \zeta_l(p_1, \ldots, p_{l-1}) = 0, \text{ all } (p_1, \ldots, p_{l-1}),$$

where $\zeta_h(p_1, \ldots, p_{l-1})$ is the excess demand for commodity $h, h = 1, \ldots, l$. In its classical version, Say's law (or Say's identity) says that

$$\sum_{h=1}^{l-1} p_h \zeta_h(p_1, \ldots, p_{l-1}) = 0, \text{ all } (p_1, \ldots, p_{l-1}),$$

(there may be nonzero excess demand at some moment for some particular commodity, but not for all commodities taken together) or equivalently,

$$\zeta_l(p_1, \ldots, p_{l-1}) = 0, \text{ all } (p_1, \ldots, p_{l-1}). \quad (1)$$

Mill did not insist on Say's identity, rather he would assert that

$$\zeta_l(p_1^0, \ldots, p_{l-1}^0) = 0$$

holds at equilibrium prices $(p_1^0, \ldots, p_{l-1}^0)$, and since equilibrium is reestablished very quickly, one may consider Say's law as holding most of the time.

The existence of an equilibrium in international trade. Mill took over the trade model of Ricardo, where comparative advantages are defined by the labour coefficients in production of two commodities (now cloth and linen) in two countries (England and Germany). Here is a version of the argument as adapted by Chipman (1979).

Let X (X^*) and Y (Y^*) be output of cloth and linen respectively in Germany (England). Production possibilities are then given by

$$\frac{X}{a} + \frac{Y}{b} \leq 1, \ \frac{X^*}{a^*} + \frac{Y^*}{b^*} \leq 1,$$

where a, a^*, b, b^* are the labour coefficients. Mill assumed that Germany has comparative advantage in linen and England in cloth, so that

$$p = \frac{b}{a} > \frac{b^*}{a^*}.$$

Let t denote the price of cloth in terms of linen, and let $M = \max\{ta, b\}, M^* = \max\{ta^*, b^*\}$ be the incomes of Germany and England. The demand functions are obtained by maximizing the utility functions under the budget constraint given by t and M, M^*, and assuming Cobb-Douglas utilities $x^\alpha y^\beta$, $(x^*)^{\alpha^*}(y^*)^{\beta^*}$ in the two countries, with $\alpha + \beta = 1$, $\alpha^* + \beta^* = 1$, we get their demand functions

$$x = \alpha\frac{M}{t}, y = \beta M, \text{ (Germany), and } x^* = \alpha^*\frac{M^*}{t}, y^* = \beta^* M^*.$$

We must have that $\frac{b}{a} > t > \frac{b^*}{a^*}$, so that $M = b$, $M^* = ta^*$, and therefore

$$x = \alpha\frac{b}{t}, y = \beta b, x^* = \alpha^*\frac{a^*}{t}, y^* = \beta^* a^* t.$$

If Germany specializes in linen, it will import $x = \alpha\frac{b}{t}$ of cloth, and similarly, England will import $y^* = \beta^* a^* t$ of linen. Equalizing the demand on one side with the demand on the other side, we must have $tx = y^*$, from which we get that

$$t = \frac{\alpha b}{\beta^* a^*}.$$

This is essentially the argumentation of Mill, who did not use Chipman's notation, instead he used parameters m ("the cloth previously required by Germany at the German cost of production") and n ("the quantity of cloth that England can make with the labour and the capital withdrawn from the production of linen"), and using that

$$m = \alpha \text{ and } n = \frac{\beta^* b^*}{\frac{b^*}{a^*}}$$

one obtains Mill's expression $t = p\frac{m}{n}$ (except that Mill erroneously had an additional q in the denominator).

The step forward as compared to Ricardo and other contemporary authors is that Mill actually shows how the equilibrium price is formed rather than just giving numerical examples of how it might look. The setup is simple (consumers have unit elasticity) but even so it is ahead of time, pointing to the existence results one hundred years later.

Equilibrium or disequilibrium? Mill is the first to pay explicit attention to equality of demand and supply, arguing that the price is defined by this equality. The exact way in which this happens could however be – and was – debated. Thus, Thornton (1870) argued against Mill's formulation by reference to an example, namely fishermen bringing in their catch and putting it for sale. As Thornton explains, this is typically done by splitting the cash into lots and the using a Dutch auction (with descending prices) until a buyer agrees to take the lot at this price. But if instead one had used an English auction (with ascending prices), then the price of the lot would be lower. So how can we speak of a price uniquely determined by supply and demand?

This was only one of several cases put forward by Thornton, where supply may be restricted in some way or another, and where the intersection of supply and demand may not determine a unique price. The labour market with a given population is another case with special relevance for the classical economists. It may be argued that in all these cases, competition is not perfect, but this concept had not been introduced yet, and even so, it is perhaps more striking that there are some elements of rationing, of unsatisfied demand. In other words, the equilibrium theory still needs to be supplemented by a theory of what happens in disequilibrium, a problem which still has found no satisfactory solution.

References:

Chipman, J.S. (1979), Mill's superstructure: How well does it stand up? History of Political Economy 11, 477 – 500.

Thornton, W.H. (1870), On labour, Macmillan, London,