MACROECONOMIC POLICY EVALUATION PROBLEM: AN ILLUSTRATION

MICHAL KVASNIČKA

FACULTY OF ECONOMICS AND ADMINISTRATION, MU BRNO

THE TASK

I want to address the question how outcomes of a macroeconomic (e. g. stabilization) policy should be evaluated.

I will argue that a sole exploration of macroeconomic aggregates *is not sufficient* to evaluate the macroeconomic policy—the axiomatic economic theory must be used as well.

The reason is that macroaggregates *are not* always well correlated with a benefit of a people—*the utility is what really matters*.

EVALUATION OF MACROECONOMIC POLICY: THEORY

The macroeconomic theory usually evaluates the outcomes of any policy by its impact on macroaggregates.

In contrary, the microeconomic theory evaluates the outcomes of a policy by its impact on an agent's utility.

There were many attempts to consolidate these two different approaches: Economists tried to derive a *social welfare function*—a social equivalent of the utility function. All theses attempts *failed*.

The reason is that an agent's utility is ordinal—it can be neither interpersonally compared nor summed up.

See Rothbard (1956) for a final critique of these attempts.

Rothbard argues that *no social welfare* function can be derived but one: Pareto-efficiency. The society as a whole can be said to be better off if and only if someone is better off and none is worse off.

Accordingly, the only socially desirable (macroeconomic) policy is the Pareto-efficient policy, i. e. such policy that increases the utility of at least one agent and decreases the utility of none.

This criterion is very strict: It excludes *all* types of macroeconomic policy since all of them have some redistribution effect and thus are not Pareto-efficient.

For our purpose we will construct another, much weaker criterion.

CRITERION OF REPRESENTATIVE AGENT

Let us suppose that all agents in a society are absolutely the same, i. e. they have the same preferences, the same production abilities and skills, the same possession etc. Let us call this agent *a representative agent*. Then any macroeconomic policy that benefits one agent benefits *each* agent. Under this condition any policy benefitting the representative agent is Pareto-efficient, and thus good for the society as a whole.

Now, we can study every macroeconomic policy under the assumption that all agents are the same. The redistribution effect is nil. We cannot prove that any policy is good under this criterion (because the criterion is too weak for this purpose), but we can say that every macroeconomic policy that makes the representative agent worse off is bad—both under this criterion and under any stronger one. This criterion allows us to exclude all policies that are clearly bad.

ILLUSTRATION OF NEGATIVE CORRELATED GDP, EMPLOYMENT AND UTILITY

Let us illustrate the non-correlation of macroaggregates and the representative agent's utility briefly on the monetary business cycle.

It is known that the monetary policy can affect both the price level and the aggregate product, but the mechanism is not known very well yet. There are at least four hypotheses consistent with the observable data: 1) the hypothesis of sticky prices, 2) the monetary misperception hypothesis, 3) the Austrian business cycle hypothesis, and 4) the real business cycle hypothesis.

Usually it is supposed that the monetary expansion increases the aggregate product first (which is supposed to be good), and then it increases inflation while the product declines back to its natural level (which is supposed to be bad). If the first effect is good and the second one bad, this "timing" can be used for the macroeconomic policy.

We will see that this interpretation might be misleading—whether the macroaggregates are correlated with the utility of the representative agent depends on which of the above mentioned hypotheses is right. Some of them—the monetary misperception hypothesis and the Austrian hypothesis—imply that the utility of representative agent *is negatively* correlated with the macroaggregates in the business cycle. Another (the real business cycle) predicts there is no connection between the real variables and the monetary policy at all. And the fourth hypothesis (the sticky prices) predicts that the monetary policy affects the agents' utilities in the same way as the real variables.

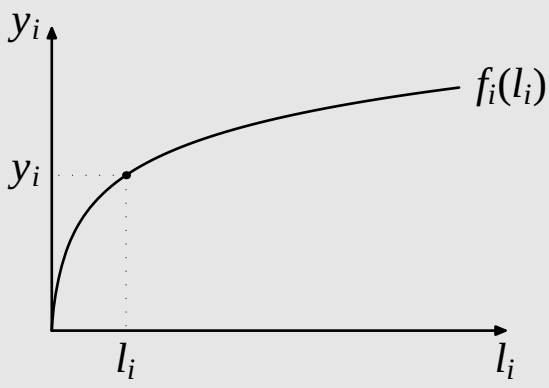
To illustrate the major thesis we will use a simplified version of the monetary misperception hypothesis.

SIMPLE NEOCLASSICAL MACROECONOMIC MODEL

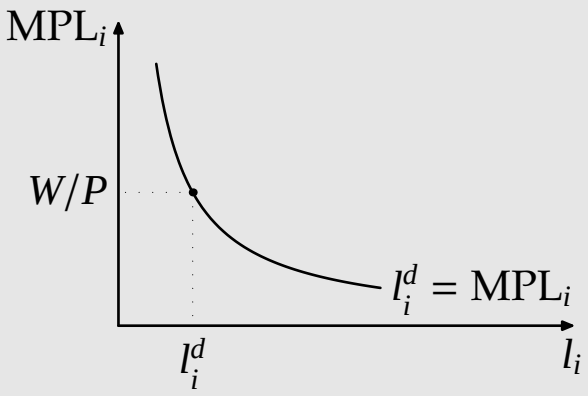
Let us derive a simple neoclassical macroeconomic model.

Let us suppose that there are firms and households in the economy. Behavior of each agent is optimizing one. Let us suppose further that prices are flexible so that they clear the market.

FIRMS AND DEMAND FOR LABOR



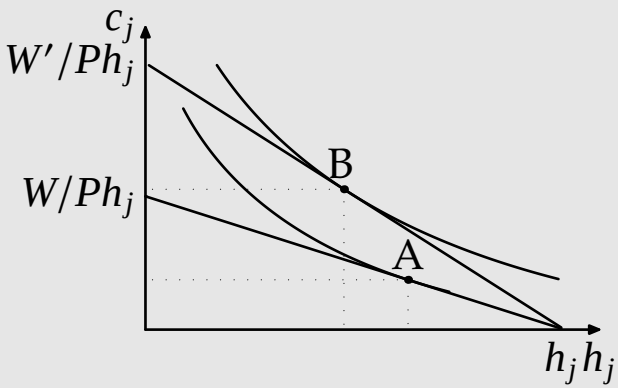
Each firm produces the same homogeneous product (called "aggregate product"). The firm's production function can be written as $f_i(l_i, k_i)$, where l_i is the amount of hired labor, and k_i the amount of hired physical capital (both measured in hours per some period). In the short run the level of capital k_i is constant, i. e. we can write the production function as $f_i(l_i)$.



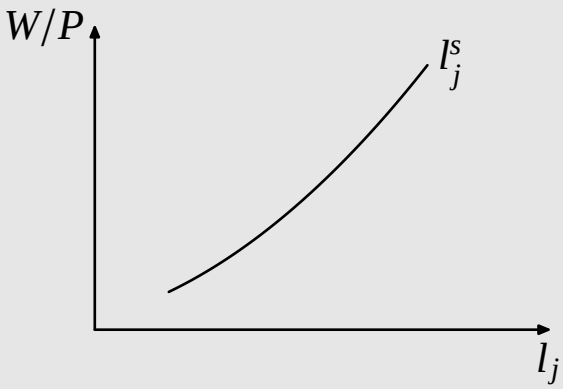
The marginal product of labor is positive but decreasing, i. e. $\partial f_i(l_i)/\partial l_i > 0$, and $\partial^2 f_i(l_i)/\partial l_i^2 < 0$

Each firm maximizes its profit, i. e. it hires an amount of labor to equate the market value of the marginal product of labor to the nominal wage, i. e. $P \cdot \mathrm{MPL}_i = W$, where W is nominal wage rate, and the P is the price level (the price of a unit of aggregate product). Each firm's demand for labor is then a function decreasing with the real wage rate, i. e. $l_i^d = l_i^d(W/P, \ldots)$. The market demand L^d for labor is simply horizontal sum of individual demands for labor.

HOUSEHOLDS AND LABOR SUPPLY



A household's utility is derived from its consumption and its leisure. Each household has some limited amount of time h_j per period. It can either addict it to work, or to leisure. If it works an hour, it makes nominal wage W. It allows it to buy the amount W/P of physical products per hour of work. If household works l_j hours per period, it can buy $l_j \cdot W/P$ units of product, but looses l_j hours of leisure.

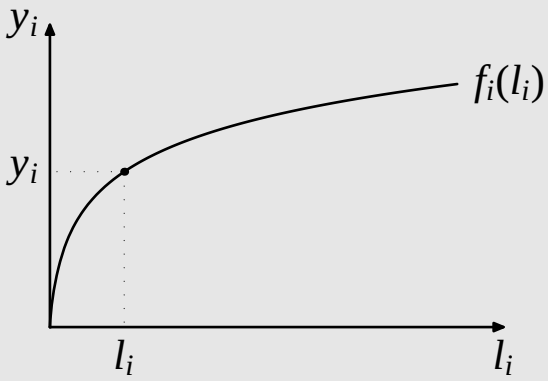


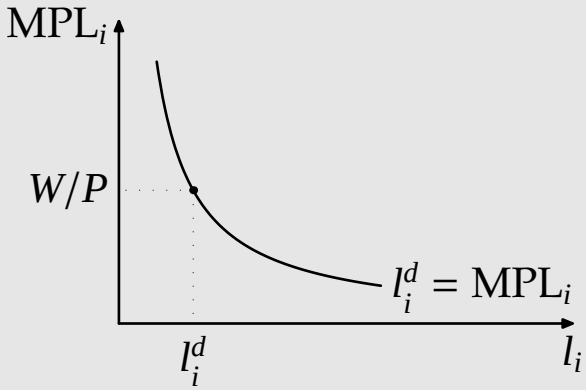
The household maximizes its utility. It chooses to work the number of hours to equate its marginal rate of substitutions MRTS between consumption and leisure to the real wage rate W/P. We suppose that the household's preferences are normal, i. e. its indifference curves are convex. Now the increase of the real wage rate W/P motivates the household to work more—to equate its marginal rate of substitution to the new level of the wage rate. Therefore each household's supply of labor is a function increasing with the real wage rate, i. e. $l_j^s = l_j^s(W/P, \ldots)$. The market supply L^s of labor is simply horizontal sum of individual supplies for labor.

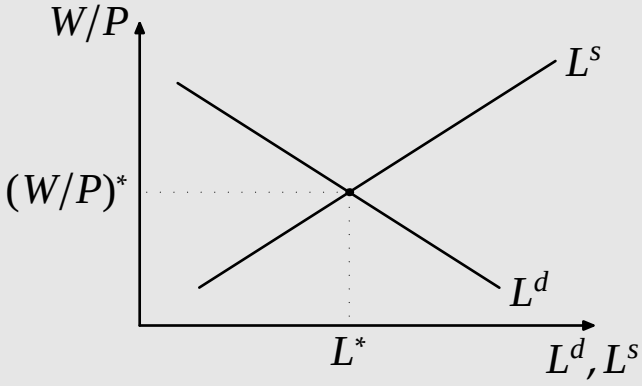
MARKET EQUILIBRIUM

The intersection of the market labor supply and demand determines the real wage rate W/P and the number of work-hours l_i hired by each firm. This way the product of each firm is determined as well.

The sum L of all employed people is *the aggregate employment* and the sum of products of all firms is *the aggregate product*.


y_i
$f_i(l_i)$
y_i
l_i
l_i

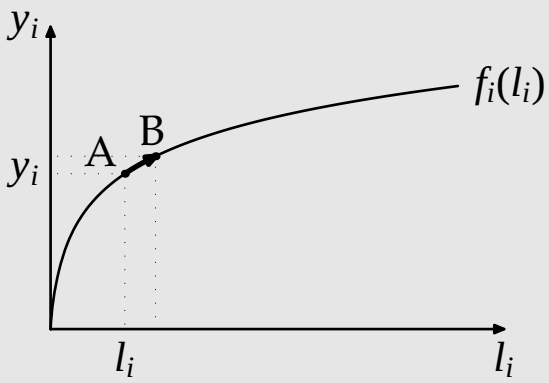

MPL_i
W/P
$l_i^d = \mathrm{MPL}_i$
l_i^d
l_i

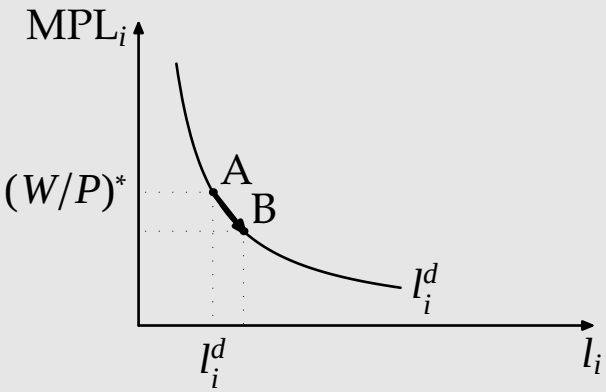

W/P
L^s
$(W/P)^*$
L^d
L^*
L^d, L^s

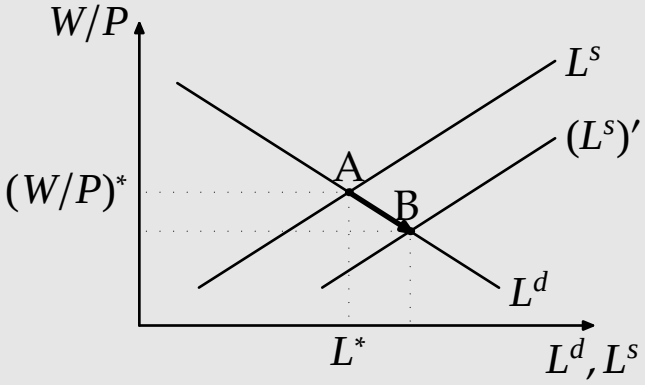
MONETARY MISPERCEPTION

Let us suppose that the price level P was constant over a long period, and than it increases to $P' > P$. Let us suppose further that firms have better information than the employees: The firms notice this price-level jump, and the households do not. Now the firms offer a higher nominal wage W' to the workers to keep the real wage rate constant ($W'/P' = W/P$).

The households have not recognized the price-level jump. They still suppose the price level is P. In such a case they misinterpret the higher nominal wage rate W' as a higher *real* wage rate ($W'/P > W/P = W'/P'$). The households increase their labor supply in such a case, which lowers the nominal wage rate slightly to W'' ($W < W'' < W'$), because the marginal product of labor is diminishing ($\partial^2 f(l)/\partial l^2 < 0$). Both the employment and the aggregate product rises.


y_i
$f_i(l_i)$
B
A
y_i
l_i
l_i

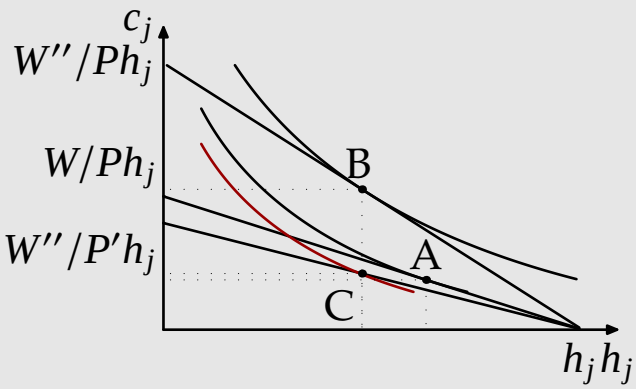

MPL_i
$(W/P)^*$
A
B
l_i^d
l_i^d
l_i


W/P
L^s
$(L^s)'$
$(W/P)^*$
A
B
L^d
L^*
L^d, L^s

PRODUCT, EMPLOYMENT AND UTILITY

A monetary expansion which rises the price level rises (under the monetary misperception hypothesis) also both the employment and the aggregate product, but the utility of the representative agent *decreases*.

Each household expanded its labor supply because it supposed it gets *more* units of consumption per one hour (i. e. consumption became cheaper relative to leisure). The household expected to get W''/P units of consumption goods per one hour, but it really got only W''/P'! That is much less than it wanted. From the definition of the marginal rate of substitution it is clear that the utility of the family *decreased*—it gave one hour of its leisure for less consumption than it was willing. The reason is the family made a mistake—it misperceived the price-level jump. This outcome is rather expectable: it is hard to expect that an error can systematically increase anyone's utility.



Later the household lowers its labor supply: both the employment and the aggregate product declines to its former level. But the decline is *not bad*—it is just a correction of the former mistake.

CONCLUSION

I have argued that the macroeconomic policy has to be evaluated on the basis of agents' utilities rather than on the basis of some observable values. The utility of the representative agent was chosen as a weak criterion to exclude those policies that do not benefit even the "average" agent.

I have also shown that such cases exist when the macroaggregates (or other observable variables) are not correlated with the utility of the representative agent. Therefore we cannot evaluate the macroeconomic policy solely on the basis of the behavior of the macroaggregates. A theory explaining *why* the macroaggregates increased or decreased is necessary to be used in the evaluation process as well. A purely empirical evaluation of the macroeconomic policy is not possible.