Lecture 2: M**arginal productivity of labor**

What determines wage rates?

It is curious that Mises does not deal systematically with the marginal productivity of labor and capital in his major treatises. These fundamental concepts crop up in a minor essay of his: *The Anti-capitalistic Mentality*, first published in 1956. Marginal productivity of capital is barely mentioned; marginal productivity of labor is treated hurriedly. According to Mises the concept of productivity of labor is nonsensical. It refers to an undefined and undefinable quantity. We have to talk about the *marginal* productivity of labor, he says, i.e., "the deduction in net output to be caused by the elimination of one worker. Then it refers to a definite economic quantity, or its equivalent in money." (p 86, edition 1972.) This is, of course, valid so far as it goes. However, it does not go far enough. It does not remove ambiguity. The elimination of *which* worker? Well, the marginal worker, naturally. Let's convert the negative definition of Mises into a positive one. Define *marginal productivity of labor* as the addition to net output to be caused by the hiring of the *marginal worker*. That is the worker whose contribution, while lower than that of those already hired, must be higher than that of others seeking employment (*submarginal* workers).

This definition is still unsatisfactory. The marginal worker should exist even if there was no hiring or firing. Nor are we talking about a definite person. We are talking about a *role to be cast*. The cast is subject to change without notice. Workers do have their individual productivity, to be sure, denials of Mises notwithstanding. The memorable simile of Mises compares labor and capital to the two blades of a pair of scissors. It is impossible to attribute quotas of efficiency to either blade; only the combination of the two can produce the desired result. Likewise, he goes on, the contribution of labor cannot be considered separately from the contribution of capital. But we don't have to separate them. We rank workers according to the decrease in output that the elimination of a particular one will cause, always assuming that the contribution of capital to the joint effort is the same. That decrease in output, by definition, is the productivity of an individual worker already employed. Similarly, we rank workers seeking employment according to the increase in output that adding a particular unemployed worker to the labor force is anticipated to cause. That increase, by definition, is the productivity of a submarginal worker. The *marginal worker* is the one among them having top rank. His productivity is just high enough so that he will make a positive contribution. He will be employed. The rest, whose productivity is lower, will not. Their employment would cause losses. The productivity of the marginal worker is called the *marginal productivity of labor*.

This concept is important because it is the only criterion by which wage rates can be determined. Wages are not fixed by the employer capriciously. As Mises explains, they are determined by the consumers who may buy or refuse to buy the consumer good. If a worker's productivity is submarginal, it means that consumers will not compensate the employer for wages paid out, causing him a loss. No enterprise can go on making losses while hoping to stay in business. Moralists are wont to call this manner of determining wage rates cruel and inhuman. They say that everyone deserves to earn a "decent living wage". However, the fact remains that the right to work is not a birthright. The 'blame' belongs to the consumer who refuses to pay top dollar for low quality or mispriced merchandise. This consumer behavior is universal: the submarginal worker himself behaves similarly when he goes shopping.

What determines the rate of interest?

A second reason why the marginal productivity of labor is so important in economics is that it marks the ceiling to the discount rate, i.e., the upper limit to the range in which the discount rate can vary. The lower limit, the floor, is marked by the marginal productivity of social circulating capital. This concept we shall explore in detail in Part Three, entitled Interest *versus* Discount. A preview later in this Chapter will follow.

Menger held that the price is not monolithic but splits in two: the higher ask price and the lower bid price. Accordingly it is incumbent upon us to study not the formation of the (non-existent) equilibrium price but, rather, the formation of the ask and bid prices. Likewise, the rate of interest is not monolithic but splits into floor and ceiling, and it is incumbent upon us to study not the formation of the rate of interest but, instead, that of the floor and the ceiling. If we do, we find that the rate of marginal time preference (cf. Chapter 4) marks the floor while the rate of the marginal productivity of capital (cf. Chapter 3) marks the ceiling.

At the lower extreme, the marginal bondholder will not allow the rate of interest to stay below the floor. If it did fall below, he would sell bonds at the high price. He would keep selling until the rate of interest rose to a level conforming to his time preference. (Recall that the rate of interest varies inversely with the bond price). At that point the marginal bondholder would repurchase his bonds *at a profit.* More concisely we may describe this market process by saying that the marginal bondholder is doing *arbitrage* between the gold market and the bond market while forming the floor to the rate of interest in the process.

At the higher extreme, the marginal entrepreneur will not let the rate of interest stay above the ceiling. If it did go through the ceiling, he would sell his factors of production (while saving the cost of maintenance). He would invest the proceeds in bonds. Clipping coupons is more profitable now than staying in production. He would continue until the rate of interest fell back to the level of the rate of marginal productivity of capital. When that happened, he would sell the bonds *at a profit* and invest the proceeds in new material factors of production that he needed in order to restart production. More concisely we may describe this market process by saying that the marginal entrepreneur is doing *arbitrage* between the bond market and the market for the material factors of production while forming the ceiling to the rate of interest in the process.

A number of authors took issue with Mises who refused to admit that the discount rate existed independently from the rate of interest. This was the position, among others, of Charles Rist and other economists of the French school. We also take the position that the discount rate is entirely different from the rate of interest in its origin and effect. It is formed by a market process entirely different from that forming the rate of interest.

What determines the discount rate?

In a manner entirely analogous to the case for the rate of interest one can see that the discount rate is not monolithic either but splits into floor and ceiling, so that one is forced to study the formation of either separately. What one finds is that the floor is determined by the marginal productivity of social circulating capital (cf. Chapter 5) while the ceiling is determined by the marginal productivity of labor.

At the low end of the spectrum, the marginal retail merchant (shopkeeper) will not let the discount rate stay below the rate of marginal productivity of social circulating capital (SCC). It is that mass of merchandise in most urgent demand in their final stages of production and distribution so that they will be removed from the market in 91 days' time or less by the ultimate gold-paying consumer. The marginal merchandise is that particular item sitting on the shelf of the marginal retail merchant that will not be replaced if its productivity falls further. The productivity of an item in the SCC is defined as the retail markup divided by the number of days of its average sojourn on the shelf of the marginal shopkeeper. He would invest the savings derived from phasing out the marginal merchandise in bills drawn on his colleagues selling merchandise with a higher productivity. The marginal shopkeeper will keep doing that until the discount rate rises and returns to the rate of marginal productivity of SCC. (Recall that the discount rate varies inversely with the bill price.) When that happens, he will sell bills from portfolio *at a profit* and use the proceeds to reorder marginal merchandise. These he will display on his shelves once again. More concisely we may describe this market process by saying that the marginal shopkeeper is doing *arbitrage* between the SCC and the bill market while forming the floor to the discount rate in the process.

At the high end of the spectrum, the marginal employer would not let the discount rate stay above the ceiling. If the discount rate went through the ceiling, he would lay off the marginal worker and invest the saving in the bill market. Typically, the marginal employer is a shopkeeper who is hiring the marginal worker to increase the efficiency of his retail operation. But if bill prices fell, indicating that the movement of the marginal merchandise has slowed, then he could do with less help. He would keep laying off marginal workers, and keep buying bills drawn on his colleagues whose retail items moved faster, until the discount rate fell back to the rate of marginal productivity of labor. At that point he would rehire the marginal worker, financing the payroll out of the proceeds of the sale *at a profit* of bills from portfolio. More concisely we shall describe this market process by saying that the marginal employer is doing arbitrage between the bill market and the *wage fund* while forming the ceiling to the discount rate in the process.

The destruction of the wage fund

The wage fund is that part of the aggregate bill market that is earmarked to pay wages to workers producing goods that belong to the SCC. When bills in the wage fund mature in 91 days or less, the proceeds will liquidate the claims of investors who have advanced funds that made it possible to pay workers weekly. It stands to reason that workers have to eat to replenish their strength they expended in production. They also have to feed their spouse and progeny. They cannot wait until the merchandise whose production and distribution has been financed by drawing bills matures in 91 days. Thus, then, we see that the bill market also has the important function to advance funds to pay *weekly* wages to the workers producing consumer goods. There is no other way to finance the production of merchandise in urgent demand that can only be sold to the ultimate gold-paying consumer for cash only after a maturation process lasting up to 91 days.

When the victorious Entente powers decided in their wisdom to block the international bill market in sabotaging the spontaneous rehabilitation of bill circulation (which no doubt would have quickly restored normal conditions in world trade) after the cessation of hostilities in 1918, scarcely did they realize that they were destroying the wage fund. They were guided by their neurotic fear of German competition. They wanted to retain their control of German imports and exports even after the lifting of the blockade pursuant to the terms of the peace treaty. Inadvertently they shot themselves in the foot. Their own population suffered just as much deprivation due to falling back on bilateral trade, that is, on barter, as a result of banning the multilateral trade in bills, as did the German. In the fullness of times the sabotage led to the unprecedented Great Depression of the 1930's and its horrendous unemployment. In the wake of the destruction of the wage fund there was no one to advance wages to be paid to workers producing consumer goods for the international market. They had to be laid off *en masse*. The blame belongs to the Entente power's sabotaging the bill market.

The gold standard was an easy scapegoat to blame for the disaster. Keynes' explanation of the 'contractionist nature' of the gold standard and of *"auri sacra fames"* (the accursed hunger for gold) was swallowed hook, line and sinker by the media, academia and the policy-maker fraternity without any further inquiry. This judgment is still outstanding and the problem has been compounded many times since 1931 when the gold standard succumbed to deliberate sabotage.

Marginalism and the logosphere

Notice the common features of the concepts of marginal utility and marginal productivity of labor, the Method of Marginalism. There is a *ranking*. Subjects are ranked. There is also a criterion deciding marginality. The *marginal subject* emerges. The great insight of Menger was that economics is dealing with the contact point between the *logosphere** (sphere of reason) and the *protosphere* (geosphere *plus* sub-human biosphere). In the logosphere the Method of Averaging is useless. The reason is simple. Human beings have their cognitive power and hence they may well change the very data while calculating the averages. Menger brilliantly solved the problem by passing from the Method of Averaging to the Method of Marginalism.

The concept of marginal productivity of labor also demonstrates the futility of the policy of high wages. The government can legislate minimum wages, ostensibly to protect employees against the "greed of employers". It may legalize coercion in granting unions the power to force members reluctant to join the strike action. It may also allow the use of violence against company property.

Government policy and union violence may indeed prevent employers from hiring workers at a wage determined by the market. But it cannot force employers to hire at uneconomic wages. All that government policy and legalized union violence will accomplish is to raise the marginal productivity of labor artificially and unnecessarily, thereby pushing ever more people into the submarginal category, that is to say, increase unemployment. Government minimum wage policy and legalized union violence are counterproductive measures: what they accomplish is the exact opposite of what is ostensibly intended.

* A similar concept, that of the noösphere was introduced by the Jesuit philosopher Pierre Teilhard de Chardin (1881-1955) in 1922 and the Soviet mineralogist Vladimir Vernadsky (1863-1945). For further details, see Wikipedia.

The tragedy of our age is that legislators and jurists do not possess a modicum of character to resist the demands of special interest groups in order to defend the interest of society at large. They succumb to the demands of the enemies of social peace and the destroyers of division of labor.

Summary

The following table summarizes our results in exhibiting the activities of the four arbitrageurs and the six markets in which they operate. Two of the six are most prominent: the *bond market* forming the bond price that varies inversely with the interest rate and the *bill market* forming the bill price that varies inversely with the discount rate. The latter is nimble in comparison with the former that varies more sluggishly. There is no rigid relationship between the two rates other than the fact that the former must keep safely above the latter. Arbitrage from the bill market to the bond market (selling bills and buying bonds) aiming to pocket the spread between the higher interest rate and lower discount rate is called *illicit interest arbitrage* that must be outlawed. When the discount surpasses the rate of interest, there is an upheaval in the financial market. Stability is gravely undermined as revealed by the fact that the risk of holding short maturity bills exceeds the risk of carrying long maturity bonds (known as the *inversion of the yield curve*. These matters will be dealt with in Chapter 21.

FORMATION OF FLOOR AND CEILING

FOR THE INTEREST RATE AND THE DISCOUNT RATE

INTEREST RATE		**DISCOUNT RATE**	
arbitrageur	between markets	*arbitrageur*	between markets
	market for the material factors of production		wage fund
marginal	____________	*marginal*	
entrepreneur		*employer*	
____________	bond market ________		bill market

marginal bondholder

marginal shopkeeper

social circulating capital (SCC)

gold market