

ECONOMIC ASPECTS OF THE PENSION PROBLEM

As It Appears Sixty Years Later

Part Two: Productivity Theory of Interest Revisited

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In Part One I discussed the clear and present danger to pension rights: deflation as manifested by the interest rates structure that has been falling for thirty years, while most observers think that the real danger is inflation. In this second part I carry out a deeper analysis of the pension problem, looking at the marginal productivity of labor and capital and its relevance to the theory of interest.

Higher marginal productivity: boon or bane?

There is a lot of loose talk about productivity. Paul Krugman is expecting miracles to start happening after an increase in a mythical productivity, provided that government spending is increased to the level matching or exceeding that during World War II.

However, as Mises pointed out, productivity is a vacuous concept unless its meaning is fixed, such as that of marginal productivity of labor. Then, and only then, can one state the pension problem. According to Mises, *the only means to increase permanently the wages and benefits payable to workers is to increase the per capita quota of capital invested in the methods of production, thereby raising the marginal productivity of labor.* (See References, *Planning for Freedom*, p 6.) This is certainly true so far as it goes. It is also true that, if we project this observation to the world at large, then we can conclude that in order to have a progressive world economy and receding poverty, global capital accumulation must accelerate relative to increase in population. The greater the quantity and the better the quality of tools, the greater will be the output of the marginal worker, that is, the greater will be the marginal productivity of labor.

In reading Mises one may get the impression that an increase in marginal productivity is *always* beneficial to society — as indeed it would have been under

the conditions he envisaged. However, in the case of a monetary system that admits both large swings and prolonged slides in interest rates, this is no longer true. If the matter were simply increasing marginal productivity, monetary policy would be a valid means of “turning the stone into bread”. All it would take is central bank action to keep raising the rate of interest indefinitely. This would force the marginal producer whose capital produces at the marginal rate of productivity to fold tent. His marginal equipment and plants would be idled. His workers producing, as they are, at the marginal rate of productivity of labor would be laid off. Marginal productivity would increase. Indeed, *the marginal productivity of both capital and labor automatically rises as a consequence of a rise in the rate of interest.* However, in this case the rise in productivity, far from being a boon, is a bane to society, as it makes output and employment shrink. The trick is precisely to make marginal productivity rise *along with* rising output and employment.

Gold standard: a safeguard against deflation

No one is asking the question how it is possible that an increase in marginal productivity could be beneficial in one instance, and harmful in another. The point is that the gold standard is an absolute prerequisite for a rise in marginal productivity to be beneficial to society. Only the gold standard can prevent wholesale capital consumption. Only the gold standard can provide the necessary background of stable interest rates. This brings the symbiosis between the pension funds and the gold standard into a sharp focus. An increase in population growth rates, whenever it may occur, will soon enough cause an acceleration of capital accumulation due to an increase in the demand for pension rights. The new capital thus created must be put to work in an optimal way.

Without the proviso on stable interest rates that can only be guaranteed by a gold standard it is possible that increasing marginal productivity may lead to diminishing of output and employment, that is to say, to deflation. *The gold standard, contrary to the propaganda of its detractors, is the chief guarantor that deflation will not occur while marginal productivity keeps increasing* — assuming that private pension funds provide fully funded plans for the benefit of prospective pensioners. Only investments in further improvements of production methods can guarantee that future pensions can be paid when they fall due.

The essence of deflation could be described by saying that the marginal productivity of capital and labor is increased through idling the marginal material factors of production and laying off the workers who operate them, but without adding new factors and workers. Output falls, employment falls, prices fall, firms fail.

Thesis, anti-thesis, synthesis

Mises built his theory of interest exclusively on his *thesis* of time preference. He categorically rejected the *anti-thesis* asserting that productivity of capital may also have something to do with the rate of interest. The fact is that a *synthesis* between the two competing and seemingly antagonistic positions is possible, as I have shown in my lectures developing my own theory of interest that extends Carl Menger's idea of distinguishing between the asked and bid price from the commodity to the bond market.

I start by defining the rate of interest as that rate at which the coupons plus the redemption of face value upon maturity will amortize the market price of the gold bond. As the market price could well be higher or lower than face value, the actual rate of interest could be lower or higher than the coupon rate. It is important to note that the prevailing rate of interest and the market price of the bond are *inversely* related. Only in the statistically rare event when the market price of the bond coincides with its face value will the rate of interest be equal to the coupon rate.

With Menger's insight we realize that the market produces not one but in fact two prices for the gold bond: a higher *asked price* and a lower *bid price*. Transactions take place at prices between these two extremes. This means that the actual rate of interest varies between a floor and a ceiling, and vary it does inversely with the bond price. Because of this inverse relationship the asked price corresponds to the floor, and the bid price to the ceiling of the range for the rate of interest.

Floor and ceiling

My theory of interest asserts that *the floor for the rate of interest is determined by marginal time preference*, i.e., time preference of the marginal bondholder. The rate of interest could not fall through the floor: it would be resisted by bondholders selling their bonds (a future good) and keep the proceeds in gold (a present good) — having a buoyant effect on the rate of interest.

The ceiling, in turn, is determined by the marginal productivity of capital, i.e., the productivity of the marginal producer. The rate of interest could not go through the ceiling either, as it would be resisted by producers selling capital goods and put the proceeds into the higher-yielding gold bonds — having a dampening effect on the rate of interest.

It is readily seen that the floor and the ceiling for the rate of interest are conceptually different. They are subject to different forces, acting independently of one another. In more detail, the floor is determined by the arbitrage of the marginal bondholder between the bond market and the gold market according to marginal

time preference. By contrast, the ceiling is determined by the arbitrage of the marginal producer between the capital goods market and the bond market according to the marginal productivity of capital.

Mises passed over in silence these instances of arbitrage. In particular, he missed the arbitrage of the marginal producer who in selling his capital goods and buying the bonds of his more productive colleagues whenever interest rates rise and, conversely, selling the bonds *at a profit* and redeploying his capital goods when interest rates fall, provides a clearest example of manifestation of human action. This action plays a fundamental role in the market process determining the rate of interest. It is “the missing blade of the scissor” (the other blade is the action of the marginal bondholder) without which there is no cutting. As this analysis shows, there is an interaction between changes in the marginal productivity of capital and the rate of interest — something Mises vehemently denied when he dismissed all productivity considerations from his theory of interest. I had to go back to Menger for inspiration to make repairs for the distortion. My theory of the origin of interest is motivated by Carl Menger’s theory of the origin of money.

Is there life after Mises?

I am an admirer of Mises who unquestionably made a great contribution to economic thought. After Menger, he will in all probability prove to have been the greatest economist of the 20th century. But Mises was a modest man and never took the view that his own word should be taken as dogma. He would have been made uncomfortable by those disciples of his who effectively frown upon further economic research by treating his work as the last word, and who automatically censor anyone who proposes a different or a more refined view. No branch of human knowledge can advance under such circumstances.

I have always considered it my duty to point out errors, whoever committed them and whatever the consequences of my criticism were. This attitude on my part is in fact completely uncontentious — it is motivated solely by the desire to advance knowledge “without fear or favor”. It is unfortunate that, when my comments involve something Mises has said, I am the object of abuse, name-calling, and personal attacks by those who seem to want to preserve the work of Mises frozen in time — rather than something that serves as a basis for debate and further research. I can do no better than quoting Mises himself:

Calling names is quite out of place if the accuser is not in the position to demonstrate clearly in what the deficiency of the smeared author’s doctrine consists. The only thing that matters is whether a doctrine is sound or unsound. This is to be established by facts and deductive reasoning. If no tenable arguments can be advanced to invalidate a theory, it does not in the least detract from its correctness if the author is called names... Those who call

authors with whom they disagree names merely confess their inability to discover any fault in their adversaries' theories.

Marginal productivity of labor

In *Human Action* Mises does not treat marginal productivity. There is one sentence on the marginal productivity of labor in the essay *Planning for Freedom*. I have quoted that sentence above. More can be found on this subject in his *The Anti-Capitalistic Mentality* (see References).

Following Mises I define the marginal productivity of labor to be the change in net output upon the elimination of the marginal worker from the labor force. A worker is marginal if his contribution to net output is smaller (at any rate, no greater) than that of any other worker. It is that worker whose job has become redundant, is no longer justified on grounds of productivity, and will be terminated by the producer at the first opportunity. (In his original definition Mises did not qualify the noun "worker" with the adjective "marginal". This would appear to leave the concept of marginal productivity of labor ambiguous.)

It is important to distinguish between two distinct possibilities of increasing marginal productivity of labor, and to analyze the difference. Marginal productivity may increase when workers reaching retirement age are replaced by newly trained workers aided by newer, better tools. The new marginal worker produces more than the recently retired marginal worker. The marginal productivity of labor has increased. Mark that total output, and possibly employment has also increased. We may call this the case of a *progressive increase in the marginal productivity of labor*.

The other possibility is very different. Here the marginal worker has been laid off without replacement. The next more productive worker at the lower end of the productivity spectrum, who is in employment already, is promoted to the position of being the marginal worker. There is no improvement in tools and production methods, only a shift of the margin from less to more productive labor. As a result, both output and employment shrink. We may call this the case of a *retrogressive increase in the marginal productivity of labor*. As an example to show how this might happen, consider an increase in the rate of interest. It will turn marginal workers into submarginal ones, earmarking them for layoff, thereby increasing marginal productivity but decreasing total output and employment.

The difference between the progressive and retrogressive increase in the marginal productivity of labor can also be seen in relation to capital. In the progressive case there is capital accumulation. Newly perfected tools or production methods are introduced as freshly trained workers are employed. This is a dynamic change that cannot help but increase total output, and possibly employment, too. In the retrogressive case the change has increased marginal productivity at the

expense of employment and, more seriously, there is capital decumulation. Material factors, still serviceable, are phased out of production along with the elimination of marginal workers. No new factors of production are introduced, only the attrition of workers and their obsolescent tools is stepped up.

Marginal productivity of capital

Apparently nowhere in his published works did Mises define the concept of marginal productivity of capital formally (although he refers to it in *Human Action* and also in *The Anti-Capitalistic Mentality*). Presumably he shied away from developing this aspect of the theory because it would quickly reveal that a position according to which productivity has nothing to do with the rate of interest is untenable.

I define the marginal productivity of capital as the change in net output which occurs when a unit value (say, \$10,000 worth) of marginal material factor is withdrawn from production. A material factor of production is marginal if its contribution to net output is smaller (at any rate, no greater) than that of any other of the same value. It is that piece of equipment or plant that the producer will discard or have idled first — because it is insufficiently productive — at which time another piece of equipment or plant with a higher productivity takes its place (quite possibly at another firm).

Again, it is important to distinguish between two distinct scenarios in which the marginal productivity of capital can increase, and to analyze the difference. In the first scenario the producer plays an *active* role. In making investments to improve tools and methods of production he aims at producing a greater amount and better quality of goods than before. There is a dynamic shift from the less to the more productive through reshuffling workers and tools. Whether the removal of a marginal piece of equipment or plant simply means reassigning it to a new task, or whether it means scrapping and replacing it with brand new material factors, makes no difference. In neither case is there a contraction of output or employment; there might well be an increase. We may call this the case of a *progressive increase in the marginal productivity of capital*.

The other scenario is again very different. Here the producer plays a *passive* role. He responds to forces outside of his control. He leaves marginal material factors of production idle. He lays off workers who have been operating the now-idled tools in the now-idled plants. Marginal productivity increases solely on the strength of a shift to another marginal material factor that is already in service. There is no improvement in tools and production methods *per se*. As a result of the shift of the margin from the less to the more productive, marginal tools and plants are rendered submarginal. Both output and employment shrink. We may call this

the case of a *retrogressive increase in the marginal productivity of capital*. Typically it occurs whenever the rate of interest rises.

It is important to look at the reaction of the marginal producer in response to an increase in the rate of interest. He will sell his idle equipment or plant (or at least will stop maintaining them) and buys bonds with the proceeds. This will allow him to participate in the earnings of other producers whose material factors produce at a higher rate of productivity than that of his own. When the rate of interest subsequently declines, the marginal entrepreneur will sell his bonds. Indeed, he has an *incentive* to do so: he can sell them *at a profit* and he can now redeploy his capital more profitably if he buys new material factors with the proceeds. As the rate of interest has come down, he can now successfully compete with other producers.

This is *arbitrage* between the capital goods market and the bond market. It reveals that marginal productivity of capital sets the ceiling to the range within which the rate of interest may vary. The arbitrage of the marginal producer between the market for material factors of production and the bond market is a most important instance of human action, one that promotes not only the stability of interest rates, but also helps renew society's park of capital goods. Along with the analogous arbitrage of the marginal bondholder between the bond market and the gold market, these two instances of human action are indispensable for the understanding of the market process responsible for the formation of the rate of interest. It goes without saying that both have a bearing upon the pension problem.

Relation between the marginal productivity of capital and labor

The first interesting question that arises in connection with the pension problem is the relation between the two marginal productivities: that of capital and labor. The observation, made by Mises, that improvement in the marginal productivity of capital *must precede and exceed* that of labor, is justified by the necessity to create the funds needed to improve the quality of life of working people. This is why the health of the pension plans has such an utmost importance. The first impetus in the long chain of improvements from the marginal productivity of capital, through the marginal productivity of labor, through the improvement in wages to the improvement of pensions must come from the pension funds themselves. If they are healthy (meaning fully funded), then they will serve as the source from which the capitalist borrows the funds lending them to the entrepreneur, who will invest them either in more tools, or in research leading to new production methods.

The second question is how to allocate the available new capital between simply purchasing more tools, or investing it in research and development (R&D) to devise improved production methods. Further analysis will show how the allocation problem is solved by the market. Clearly, it cannot be solved at the level

of the shop-floor, nor even at the level of the executive board-room. The decision must be made at the level of the pension funds themselves, taking into account demographic movements such as net changes in the number of pensioners relative to the number of workers contributing to pension plans. In other words, we must compare the number of old workers entering the rank of pensioners, who stop contributing to pension funds and start drawing pensions, to the number of new workers entering the labor force and start contributing to pension funds.

I have treated this allocation problem at length in my other writings, through graduating from a simple diagonal model of the capital market involving two participants (the supplier and the user of capital, a model I consider hopelessly inadequate) to what I call the *square, pentagonal, and hexagonal models of the capital market*. I shall not pause here to repeat the evolution of these models. Let it suffice to look at the hexagonal model of the market for capital goods involving six participants: the annuitant, the annuitand, the entrepreneur, the inventor, the capitalist and, finally, the investment banker (see References).

If the balance between the annuitands and annuitants changes in favor of the latter (otherwise expressed, there is a demographic shift increasing the number of pensioners relative to the number of new entrants to the labor force, *decreasing* the demand for pension rights), then more funds will be allocated to entrepreneurs to acquire more or better tools, and less to the inventors working on improved production methods. This is so because production of consumer goods must increase immediately to cover the needs of the increasing retired population, while the increase in the marginal productivity of capital can wait.

Conversely, if the balance between the annuitands and annuitants changes in favor of the former (there is a demographic shift increasing the number of new entrants to the labor force relative to the number of new pensioners, *increasing* the demand for pension rights), then more funds will be allocated to inventors to work on improvements of production methods, and less to entrepreneurs to upgrade their park of material factors of production. This is so because the priority now is to prepare for a future increase in the marginal productivity of capital. The future pension payouts to workers who are just entering the labor force must be met when they will be ready to take retirement. There is no pressing problem to increase the production of consumer goods immediately, because the younger workers will tend to save more in the form of pension contributions or otherwise and, accordingly, will have less free-spending cash available.

The point is that the market will always find the “optimal mix” of allocating funds between entrepreneurial and R&D capital to fit the given demographic data, provided that it can operate freely, and the central bank is constitutionally barred from “regulating” the rate of interest, and the government refrains from setting up compulsory “pay-as-you-go” pension schemes. The optimal solution of society’s

pension problem furnishes the strongest arguments against the so-called welfare state and the so-called compensatory monetary and fiscal policy of the government.

Mises: happy warrior combatting inflation

The strength of Mises is in his unflagging criticism of inflationism. This is all very well. However, many important things have happened since his death showing that governments and central banks under the regime of irredeemable currency can inadvertently and unwittingly cause deflation, even as they avowedly want to pursue inflationary policies. The effect of this is the blurring of a clear line between inflationism and deflationism. They are subsumed under the heading of government and central bank ineptitude.

Austrian scholars seem to be completely unprepared for this development. They keep parroting the anti-inflation message of Mises when the danger is deflation (more precisely, deflation now, hyper-inflation later; perhaps much later). Mises treats deflation in an off-hand fashion, as if it was merely a side-effect of previous inflation (credit expansion). This hardly does justice to the problem. We now know that *deflation under the regime of irredeemable currency is a great problem of economics in its own right*. For example, Mises deals with the perennial effort of the government and the banks to suppress the rate of interest, if need be all the way to zero, only as a manifestation of their inflationary propensities. However, a prolonged decline in interest rates is not necessarily inflationary *per se* under the regime of irredeemable currency. On the contrary, *it can be highly deflationary on account of being the cause of wholesale destruction of capital accumulated earlier when the rate of interest was higher*. Still more serious is ignoring the possibility that the government and banking system may succeed in pushing the rate of interest down all the way to zero without actually triggering hyperinflation, and in doing so unwittingly causing deflation. Declining interest rates are responsible for the hard-to-detect erosion — ultimately destruction — of capital that is plaguing the world economy right now.

Incidentally, the same argument about the artificial suppression of the rate of interest furnishes a major part of the real explanation for the Great Depression of the 1930's. By sabotaging the gold standard the governments allowed bond speculators to bid bond prices sky high, thus driving interest rates down to unprecedented lows. A monopoly situation for government bonds was created by removing their only competitor: gold. The marginal bondholder's only weapon, gold, to protest uneconomically low and falling interest rates was forcibly (and unconstitutionally) taken away from him. His arbitrage between the bond market and the gold market was frustrated. The stealthy and illegal introduction of open market operations of the central bank, making bond speculation risk-free, aggravated the problem of capital destruction even more.

In the same order of ideas I also mention that in the public mind the deliberate wrecking of the gold standard by the government is firmly associated with inflation, to which it has undoubtedly given rise especially since 1971, the year when the U.S. defaulted on its international gold obligations. But as a more detailed analysis shows, the absence of gold standard could also cause deflation through making interest rates fall, namely, by rendering bullish bond speculation risk-free. The Austrian school has so far failed to study this important fact, even though this is the best argument to show that the pension problem cannot be satisfactorily solved without fully rehabilitating the gold standard.

I hope that my contribution to the vexing problems of the theory of interest will help to end the century-old fratricidal war between the time preference and the productivity schools. I also hope that my thesis, that the regime of *falling* (as distinct from *low*) interest rates (now entering its fourth decade) causes capital destruction, deflation, and depression will be exhaustively debated and the alarm will be sounded, in order to save the pension funds from extinction, and society at large from excruciating economic pain. Finally, I hope that the day is getting closer when a new Austrian theory of interest is universally recognized — just as the Austrian subjective theory of value, superseding Adam Smith's cost-based theory already is.

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