The DMVP-MVP Controversy: A Note

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We are all familiar with the process of discounting the future. From the earliest courses in economics we are taught that money receivable right now is not the equivalent of money receivable one year hence; that money receivable one year from now is not equivalent to money which will fall in to our clutches after a period of two years. And not just because inflation may erode part of the value, or because of the risk of never seeing the money. Even in a perfectly certain world of no inflation, where all accounts receivable were fully guaranteed, we would still value money more, the sooner we were to receive it.

If this were not so, we could never act in the present,[1] for every action done now *could* have been done in the future. The fact that we choose to act in the present, when we could have waited, shows that we prefer the present; that we enjoy goods, the sooner, the better. But the future will present the same alternatives: action and non action. *Future* action will thus *also* imply time preference for the present, paradoxically. By acting in the immediate future, instead of waiting for the even more distant future, we also show ourselves as present oriented. The only way to illustrate a lack of preference for the present is never to act at all—a manifest impossibility for human beings.

One implication of the foregoing is that we discount money receivable in the future. This is done in accordance with the rate of interest. Simply put, we prefer a dollar today to a dollar tomorrow because we can always put our present dollar in the bank, collect the interest payment, and have more than a dollar. Given a non-inflationary world and a guarantee that the bank will not renege, we are sure to have more in the next period. If the rate of interest is 10 percent, then $1.00 today will be worth $1.10 at the end of one year.

Alternatively, we can say that payments receivable in the future

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[1]Ludwig von Mises, *Human Action*, 3rd ed. (Chicago: Henry Regnery, 1966), p. 484.

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are *discounted* to obtain present discounted values. Thus $1.00 due at the end of one year is worth $.90 today, for $.90 is the amount of money that has to be put in the bank today for it to turn into $1.00 at the end of the year (ignoring rounding errors and compound interest). We can say, then, that $.90 is the present discounted value of $1.00 receivable in one year.

All of this is elementary, and accepted by the entire economics profession. It would not be worth mentioning, but for the fact *that* virtually all economists refuse to *apply* the doctrine of discounting future income streams to the case of marginal productivity. Specifically, in the view of most economists, there is a tendency, on the market, for factor payments to equal the Marginal Value Products (MVP) of the factors. Abstracting from questions of perfect or imperfect competition, this means, for example, that in the view of the profession, wages will come to equal the value of the marginal product of labor (the marginal physical product of labor multiplied by the price at which the product can be sold).

In contrast, the Austrian school[2] insists that what tends toward equality with wages is not MVP, but *discounted* MVP, or DMVP. There is no real point at issue when work on immediate consumption goods is considered. For example, the wage of the grocer's clerk, it is admitted by both sides, will tend to equal his MVP, because there is virtually no time that elapses between the labor and the consumption of the final good. Since there is no time under which the discounting process can work, DMVP reduces to MVP.

The divergence between the Austrian and orthodox schools is reached in the cases where labor is added to the value of intermediate or higher order goods. Consider a year's labor on a process that will not reach the consumption stage for a number of years. Here, the Austrians insist that cognizance be taken of the time element; that just as we all commonly discount values receivable only in the future we not falter when it comes to applying this insight to discounting the value of labor imputed to products which will not be usable until some years have passed. The Austrians argue, in other words, that *all* values receivable in the future be discounted by the rate of interest, even the values of the marginal product of labor, or any other factor, when such value cannot be used in consumption until an elapse of time has taken place.

Why do the non-Austrian economists refuse to follow the Austrians?

[2]Murray N. Rothbard, *Man, Economy, and State* (New York: Van Nostrand, 1962) pp. 406-09 and 431-33; and Eugen von Böhm-Bawerk, *Capital and Interest*, vol. 2 (South Holland, Ill.: Libertarian Press, 1959), pp. 302-12.

on this seemingly straightforward application of the principle of discounting held by all? This is difficult to answer since most economists completely ignore DMVP, concentrating on MVP instead. Therefore the few orthodox economists who even *mention* DMVP (rejecting it in favor of MVP) are of great interest.

In the view of Sir John Hicks,[3] DMVP and MVP are consistent with each other; they are, in effect, alternatives, and either can be reasonably chosen. In Professor Hicks's words: "This conception [DMVP] is intermediate between 'net productivity' and 'marginal productivity,' as we have defined them; just as they are consistent with each other, since they describe the same phenomenon under slightly different assumptions, so 'discounted marginal productivity' is consistent with them."[4] And what are these "slightly different assumptions" that distinguish "net" and "marginal" productivity? Hicks answers: "'Net productivity' assumes the methods of production to be fixed; marginal productivity assumes them to be variable."[5] But this is puzzling, for it is nonsense to suppose that the methods of production are fixed. What makes these proceedings mysterious indeed is that no one knows this better than Professor Hicks himself, for in his very next sentence he tells us: "In fact, there can be very little doubt that [the methods of production] nearly always are variable to some extent; and consequently the marginal productivity theory has a deeper significance than the [net productivity theory]."[6] If this is so, it seems hard to conclude that "net" and "marginal" productivity theories are equivalent.

But what of our main point: Are DMVP and MVP theories equivalent? What reason does Professor Hicks give in support of his view that these latter two are consistent with each other? In point of fact, he gives *no* reason to support this conclusion. What he does say is that if we make the highly artificial assumption that the period of production ("the length of time elapsing between the payment of labor and the sale of the product") is fixed, then, "in order to maintain the condition of equality of selling price and cost of production, the cost of [any] additional circulating capital [equal to the wage paid multiplied by the period of production] must be deducted from the marginal product, i.e.[,] the marginal product (estimated in this manner) must be 'discounted.'"[7]

But this statement poses more problems than it answers. First

[3]John R. Hicks, *The Theory of Wages*, 2nd ed. (New York: St. Martin's Press, 1963).
[4]Ibid., pp. 17ff.
[5]Ibid., p. 14.
[6]Ibid.
[7]Ibid., pp. 17ff.

there is the question of exactly *what* is to be deducted from the MVP. In the Austrian view, the deduction is equivalent to discounting the MVP by the rate of interest. In Hicks's view, what is to be deducted from the MVP is nothing based on the interest rate, but rather, "the cost of additional circulating capital ... [which comes about] ... when the amount of labour employed slightly increases."[8] Circulating capital, it will be remembered, is equal to "the wages paid, multiplied by the length of time elapsing between the payment of labor and sale of the product." Why this amount is selected, rather than any other, is never explained. Nor are we given any reason to believe that a discount, so constructed, is equivalent to the discount based on the market rate of interest.

On the contrary, there is every reason to suppose that the two methods will give *different* results. In the Austrian view, the discounting period is between the time of the payment of labor and the *final* sale to the consumer. In the Hicksian vision, the relevant time, the period of production, is measured from payment of labor to the sale of the product. For Hicks, then, *any* sale will do, whether or not it is to the final consumer of the good.

For Austrians this matter is not at all arbitrary. The reason final consumption is insisted upon is that this alone is consistent with the essence of the whole process of production. The end, the goal, the final aim of production is *consumption.* It is not until the process has reached the consumption phase that it can be said to be completed in any meaningful sense. A worker's efforts have no value whatsoever if they are not eventually carried through to the consumption level. These efforts, then, must be discounted back to the present from the time that they come to fruition, that is, from the time that they become embodied in an item of final consumption. If this were not so, then the concept of DMVP would make no sense. For if every time a change in vertical integration of industry occurred, and there were greater or fewer stages of production between the worker's efforts and the final consumption stage, this would mean an increase or decrease in the number of sales that the good had to go through before it reached the consumer. But if this is so, it would necessarily imply a change in the "length of time elapsing between the payment of labor and the sale of the product." Thus, every time vertical integration increased, and more stages of production were created, this "period of production" would decrease; if the period of production decreases, then, for Hicks, the circulating capital must fall, since circulating capital is the wage multiplied by the period of production. And if

[8]Ibid.

circulating capital falls, then the DMVP must rise, since DMVP equals MVP minus a decreasing circulating capital, and MVP stays the same. Alternatively, vertical disintegration would imply a decrease in DMVP. Thus, a purely *legal* phenomenon, the ownership and organization of business enterprise, would intimately affect a purely *economic* phenomenon, the DMVP, which is defined in terms of productivity and the interest rate, and not at all in terms of mere legalistic ownership and sale.

Hicks gives no reason for wanting to "maintain the condition of equality of selling price and cost of production." Indeed, the Austrian view would be the diametric opposite. Here, there is no assumption that merely because businessmen invested in a product, and undertook certain expenses and costs, that *therefore* the consumer will spend an amount of money necessary to make the process profitable. This could only occur if we assumed perfect knowledge and hence an evenly rotating economy, an experience denied to man on this side of the Garden of Eden.

Finally, and most importantly, this scenario of Hicks's is *not* an indication that DMVP and MVP theories are consistent with each other, as Hicks supposedly sets out to show. Rather, it is a *denial* of that claim. If we accept all the assumptions made, it is an *acceptance* of the DMVP view ("the marginal product must be 'discounted'") and *hence* a *rejection* of the MVP theory, which denies that any such deduction must be made.

We need not, of course, accept the fixity of the period of production; we can, with Hicks, in his very next paragraph, "assume that the period of production is variable."[9] If we do, we will learn that "the additional product created by additional labour under the circumstances (of variability of the period of production) is a true marginal product, which in equilibrium must equal the wage, without any discounting."[10] So we see Hicks in his true colors: a complete reversal of field, where the MVP theory is now to be accepted, fully, and the DMVP theory to be rejected; again, far from his stated view that they are equivalent.

Undaunted by this, in his most recent conclusion, Professor Hicks completely reverses field once again and concludes: "Such a modernized wage-fund [the DMVP theory, with the realistic assumption of a variable period of production] is perfectly consistent with marginal productivity [MVP]; and I have often been tempted to use it on a considerable scale in this book. But I have concluded that the advantages

[9]Ibid., p. 14.
[10]Ibid., pp. 17ff.

of such a treatment would not compensate for the obstacles it would probably place in the way of readers brought up on the English tradition."[11] In other words, DMVP and MVP theory are once again fully compatible, but MVP theory is preferable on aesthetic grounds! What is to be done? I think we can conclude that MVP and DMVP theory are logically inconsistent, one denying the need for any discounting of MVP and the other insisting upon it.

I turn next to Professor Earl Rolph,[12] who also sees a possible reconciliation of the DMVP and the MVP theories. Defining the former as the view that "[factors] receive the discounted value of their marginal products," Professor Rolph sees the dispute as merely a verbal one: "An examination of the context in which these two propositions appear in economic discussions reveals that the term 'product' does not mean the same thing."[13] In the MVP view,"'product' refers to the *immediate* results of present valuable activities" while "in contrast, the term 'product' in the phrase 'discounted value of marginal product' refers to some *remote* product" (emphasis is mine).[14]

Now this "remote product," to the Austrian, is *consumption*, the be-all and end-all of production. True, if one is prepared to admit that any immediate results of an industrial process, such as a hole in the ground, in preparation for a new dwelling, that will not result in consumption goods for years to come, are *equivalent* to a final product, then one can agree with Professor Rolph that "the only apparent difference between the two views is a choice of words to say virtually the same thing."[15]

The Austrians, however, are not willing to make such a facile equation. It is only in the evenly rotating economy, where full and perfect information of all future events is given to all market participants, that each and every immediate result of an industrial process in the higher orders of capital goods will be guaranteed to come to fruition, eventually, as a consumption good. In the real world, *not all* "immediate results" of production will be so blessed. Many holes in the ground will remain just that—holes in the ground. Be the intentions of the entrepreneurs ever so well motivated, they will not all be filled up with houses.

[11]Ibid., pp. 17-18ff.

[12]Earl Rolph, "The Discounted Marginal Productivity Doctrine," in *Readings in the Theory of Income Distribution* (Homewood, Ill.: Richard D. Irwin, 1951), pp. 278-93.

[13]Ibid.,p. 279.

[14]Ibid., pp. 279-80.

[15]Ibid., p. 282.

Moreover, even if all intermediate efforts are crowned, eventually, with final consumption results, the equation of DMVP and MVP is still invalid. Even in this case there would be a *time element* differential to distinguish between them. The higher the order of production, the further removed, in time, from consumption.

As Professor Rothbard states:

> Every activity may have its immediate "results," but they are not results that would command any monetary income from anyone if the owners of the factors themselves were joint owners of all they produced until the final consumption stage. In that case, it would be obvious that they do not get paid immediately; hence, their product is not immediate. The only reason that they *are* paid immediately (and even here there is not strict immediacy) on the market is that capitalists *advance* present goods in exchange for those *future* goods for which they expect a premium, or interest return. Thus, the owners of the factors are paid the *discounted* value of their marginal product.[16]

It must be concluded, then, that an immediate result of a higher order production process is *not* equivalent to consumption; and that factors do *not* receive the undiscounted value of their immediate marginal products. Rather, factors tend, in the unhampered market, to receive the *discounted* value of what their marginal products are thought to be worth as potential, future consumption goods.

In the remainder of this paper I shall construct another objection to DMVP theory, and then try to show that it too fails to disprove the validity of DMVP.

According to this objection, DMVP theory is satisfactory for the intertemporal level, but not on the intratemporal. Intertemporally, it makes sense for the value of a factor to be determined, in part, by how many years away from final consumption it lies. If factor A is to be used *now*, and factor B one year from now, then the price of B must be adjusted downward accordingly; B must sell for less then A. But suppose A and B are identical! If intratemporal equilibrium is to be attained, then identical factors must receive the same remuneration. B's price cannot then be adjusted downward by the discount, as DMVP theory would have it.

First, suppose that there are two equally skilled carpenters: Ike and Mike. They are exactly alike insofar as carpentry abilities are concerned. They each, therefore, have the same MVP. An entrepreneur, employing several other carpenters, will benefit (lose) by the exact same amount whether he hires (fires) Ike or Mike. His revenues will change by the same amount regardless of which carpenter he

[16]Rothbard, *Man, Economy, and State*, p. 432.

deals with. Under such assumptions, intratemporal equilibrium must require that Ike and Mike receive equal wages. If they do not the familiar market forces will be set up in motion to make sure they do.

But suppose Ike takes a job in a consumption industry, where his work is practically simultaneous with consumption, and Mike finds employment in a higher-order production process, whose fruits will not be available for consumption for 10 years. It would seem, according to DMVP theory, that Mike's wages would have to be heavily discounted, and hence much lower than Ike's. But if this is so, it is in violation of the intratemporal equilibrium that must exist, since we are dealing with equally productive workers, by assumption.

Consider, also, two identical 100 pound bags of coal. Intratempora equilibrium demands that they receive the exact same price. But i one of them is used for heating a home right now, and the other used in the beginning step of a process which will not be completed for one year, then it would seem that this latter bag of coal will have to sel at a lower price, low enough to reflect the discount called for by the DMVP theory.

The examples could be multiplied without limit.[17] Fish is used for immediate consumption—and also for salting and curing. Some wine is allowed to ferment for one year. But other wine, identical to the first, at the outset, is allowed to ferment for longer periods of time DMVP theory, it is contended, cannot be correct if it calls for differen prices for the same identical good, service, or factor. And yet if this is not what would satisfy DMVP, it is hard to see what would.

The way to solve this paradox is to take this objection "by the horns" and show it to be without merit. Accordingly, for the sake o argument, assume its analysis is correct: if the MVP of the bag of coa to be used up for consumption is $100, and the rate of interest is five percent, then it follows ineluctably that the equilibrium DMVP of an identical bag of coal, to be used in a one year long process, is $95 ignoring compounding complications. So the intertemporal or time market may be in equilibrium, but the spot coal market certainly cannot, for one bag of coal sells for $100, while another, identical to the first in every way, sells for $95. The only problem is, entrepreneurs at the higher level of production will not be able to buy any coal! Why should they be able to if they are only willing to pay $95 for something that coal owners are able to charge $100 for?

What must then happen? The entrepreneurs at the higher stage

[17]See Böhm-Bawerk, *Capital and Interest*, for an enumeration, as well as for an eloquent and fully complete analysis.

of production will have to abstain from all projects using coal that cannot attain a DMVP of at least $100, the alternative cost of coal. But at a five percent interest rate, in order to reach a DMVP of $100, the MVP must be $105.

In the words of Professor Rothbard:

> The more remote the time of operation is from the time when the final product is completed, the greater must be the difference allowed for the annual interest income earned by the capitalists who advance present goods and thereby make possible the entire length of the production process. The *amount* of the discount from the MVP is greater here because the higher stage is more remote than the others from final consumption. Therefore, in order for investment to take place in the higher stages, their MVP has to be far higher than the MVP in the shorter processes.[18]

Thus we see that this objection is without merit. The DMVP's must be equated, in the evenly rotating economy, in all areas of production, not the MVP's. Coal will have the same price (assuming equal quality) wherever it is used in the structure of production: for consumption goods, or in long-term heavy industry. But the further away, in time, from consumption a process is, the higher will its MVP have to be to make its employment there profitable, and to result in a DMVP equivalent to the lower orders of production, and in consumption.

[18]Rothbard, *Man, Economy, and State*, p. 409.