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Comment on Donald Gordon
by Allan H. Meltzer

It is many years, nearly a quarter century, since Donald Gordon taught me the game of GO and mumbled at lunch about an obscure economist named von Thunen. I am as surprised, as some of you may be, to find myself discussing von Thunen's monetary theory so many years after my lunch time acquaintance with Gordon and von Thunen ended. You may credit or blame Mark Perlman for my presence here. But you must credit or blame Gordon for anything I say about von Thunen. My entire exposure to von Thunen's work has come to me, on various occasions, from Gordon. I am not alone; I assure you. von Thunen's monetary theory exists only in unpublished form. Currently, Gordon tells us, we depend on him. To his other outstanding qualities we now add that he is the reigning expert on the monetary theory of von Thunen. Since I read his paper, I can claim to be, not an expert on von Thunen but an expert on what Donald Gordon knows about von Thunen. I speak to you from that vantage point.

The first question to be asked about any discovery of obscure papers is: How great is the loss from not having the unpublished papers as a base or stimulus for further work? In the arts, an undiscovered painting is valued at something close to the current market price of the existing canvases of equal quality. The same is true in letters, but generally is not true about scientific propositions. Long after the biologists rediscovered Mendel's laws, they discovered or rediscovered Mendel's work. This raised their appreciation of Gregor Mendel but it added little to what was known about genetics.

The second question to be asked is: What is the quality of von Thunen's monetary theory taken on its own? Gordon's claim is that von Thunen has a
"modern flavor" compared to his contemporaries mainly because his "treatment of monetary theory as a problem of asset choice was unique for its period." (p.20) This claim is based on two or three main propositions that Gordon extracts from von Thunen's work. I will summarize these propositions and some of the others that Gordon develops. I will not, however, be able to answer fully the question about the quality of von Thunen's work because Gordon does not give us the information on which to base the final grade. When grading papers, I look at more than the quality of the best material in the blue book. I look also at the surrounding material to see whether the best statements are a small part of a larger stream of consciousness containing many fallacies, inaccuracies and undeveloped ideas or whether they are a representative sample of the individual's thinking. Gordon's reference to breathtaking leaps and egregious errors suggests that the average quality is below the quality of the material he presents. In von Thunen's defense, there is of course a mitigating factor. He never published the material. He may have intended to exempt the examination in monetary theory and perhaps had no intention of letting anyone read his bluebook.

The third and last question I will ask is: How does von Thunen's work compare to his contemporaries? von Thunen wrote his monetary theory between 1819 and 1825. This is a very poor choice because his contemporaries include Ricardo and Henry Thornton. I believe that if a copy of Henry Thornton's Paper Credit had come into his possession, he would have had ample reason to avoid using the material Gordon presents to satisfy the monetary theory exam. I will develop this point after presenting von Thunen's main ideas.

Before turning to the ideas, I would like to make one criticism of Gordon's paper that is related to this last point. Gordon says very little about the
intellectual influences on von Thunen, so it is hard to judge how much of the material is original. Gordon tells us that von Thunen was aware of the controversy over Say's law, and he even suggests that von Thunen's interest in monetary theory was stimulated by the problem of unemployment or general overproduction as it was called. But he does not tell us -- perhaps because he does not know -- how von Thunen got this information or how familiar he was with the writings of contemporaries or predecessors. Perhaps all students of the history of thought know when Locke, Hume, Smith and Ricardo (to name a few) were translated into German and know whether von Thunen read the Edinburgh Review. Information of this kind, if it is available would be helpful in judging his contribution. Also helpful, if it is available, is the contents of von Thunen's library or the references in his footnotes. Gordon gives us none of this, again perhaps he does not know; possibly no one knows what was in von Thunen's library, but we should be told about the references in his footnotes to monetary theory and to Say's law.

The Propositions

Five main propositions about monetary theory stand out in Gordon's text. I will state the propositions before commenting on the argument. The five propositions overlap, so the number of propositions is arbitrary and useful only as a means of organizing the discussion.

(1) In a closed economy, money prices are proportional to the nominal stock of money; the equilibrium value of real balances is independent of the stock of money.

(2) Increased productivity raises real income and standards of living and does not produce unemployment or a general glut.
(3) The rate of interest is both a monetary and a real variable.

(4) The demand for money is the demand to hold an asset and depends on the money rate of interest, not the real rate.

(5) The aggregate demand for money and capital are obtained by summing the individual demand curves. I will say nothing more about this proposition.

Proposition 1

There is a very clear statement of the proposition that, in a closed economy, the price level is proportional to the nominal quantity of money. Gordon quotes von Thunen as follows:

"What is the limit of this rise in price (following an increase in the quantity of money)? This cannot be reached until all the paper money...can be usefully applied to circulation. But this will not be the case until the nominal prices of things stand in the same ratio to the quantity of the circulating medium as they earlier were; that means for a fourfold increase in the quantity of money, a fourfold increase in nominal prices."

Proportionality is reached because no one will want to leave additional money in his strong box. The quote speaks of the money "lying uselessly in their safes." Gordon and I interpret this statement to mean that the holding period yield is zero.

Past experience should make us wary about over-reading statements connecting money and prices particularly when the author is careful to tell us that his discussion is restricted to a closed economy. The closed economy assumption is the assumption used by Locke more than a century earlier to

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1 Gordon, p. 17
argue that "any quantity of money would serve to drive any proportion of trade, whether more or less." Locke's proposition comes more than a century before von Thunen's. Locke goes on to argue that for the world as a whole, no one would be richer if the quantity of gold and silver were doubled in all countries. This is indeed an odd proposition for a mercantilist, as Locke is generally regarded, and the proposition can best be explained as an expression of the belief that the price level is proportional to the quantity of money in a closed economy.

Locke, like von Thunen, did not apply proposition (1) to individual open economies. Gordon is very clear on this point. Here, too, von Thunen seems consistent with Locke.

Every reader of Viner's Studies... knows that one can find a large number of early statements about the proportionality between money and prices in closed economies. Many of these are statements that recognize that the value of real goods and the real volume of trade in closed economies depend on the real resources in the economy and not on the number of pieces of paper or bars of gold. Many of the early statements are followed by extreme versions of mercantilism that express the belief that, by holding prices down, the quantity of money and real wealth can be increased. That is why von Thunen's failure to connect the open and closed economy and his failure to discuss the relation between money and the price level of current production leaves the interpretation of his statement open.

2 The quotation is from Hegeland, The Quantity Theory of Money (1951). The material on Locke is taken also from Viner, Studies... (1937).
Proposition 2

The 19th century controversy about general overproduction and unemployment, like many other controversies in monetary theory, turned on the distinction between relative and absolute prices and on the relation between the excess demand for money and the excess supply of goods. von Thunen draws on empirical evidence to dismiss the idea that technical progress creates unemployment and lowers standards of living. He is surely correct in dismissing the idea that cartels, state bureaucracies, armies or the destruction of output created the higher standards of living that he observed. His argument shows in many places that von Thunen was an astute observer who knew how to draw inferences from current and past events. But the observations do nothing to the formal theory of money. Gordon tells us that von Thunen did not explain why or how equilibrium was reestablished. (p. 19)

Proposition 3 and 4

I believe Gordon's strongest claims for von Thunen as a monetary theorist who made "breathtaking leaps" rest on two propositions. According to Gordon, von Thunen distinguished between real and nominal interest rates and recognized that the money rate of interest, not the real rate, affects the demand for money. To understand these propositions, in the light of Gordon's argument that the price level was held constant in von Thunen's open economy, it is important to know that Gordon does not define the nominal rate as the real rate plus the anticipated rate of inflation. He explicitly excludes the rate of inflation, I believe, when he writes that von Thunen "avoids the issue of ... interest to current economists in our inflation prone era" by holding the price of goods and services constant when he discusses changes in interest rates.
I found this terminology confusing. I believe it is more consistent with standard practice to use the term \textit{real} rate to refer to the rate of return that owners of assets receive inclusive of capital gains and losses. I believe this is the rate of interest that Gordon calls the \textit{nominal} rate. I will use my terminology hereafter and use nominal rate to refer to my real rate plus the anticipated rate of inflation. The real rate can be written as the product of two terms. The first is the expected return to capital, per unit of capital. I will refer to this term as the marginal productivity rate. When the first order conditions on the production function are written down, the marginal product of capital is set equal to the expected return. To get the real rate of interest, we multiply the marginal productivity rate by the ratio of anticipated (or actual) prices of assets to anticipated (or actual) prices of output. When asset prices rise (or are expected to rise) relative to output prices, owners of capital assets receive (or anticipate) capital gains that augment the marginal productivity rate. If the price level is fixed, as in most of von Thumen’s discussion of interest rates, changes in asset prices cause real rates to differ from marginal productivity rates.

The real rate in von Thumen depends on the degree of uncertainty and on short-term changes in the balance of payments. These affect the real rate by changing the demand for capital assets. The prices of capital assets rise, raising the realized returns, but inducing increased consumption (a wealth effect arising from capital gains) and increased investment because owners of current production are induced to augment the stocks of capital by diverting output from consumption to capital formation. The increase in consumption and investment should then raise the prices of current output.
Diminishing marginal product of capital applied to a fixed amount of land (of given quality) lowers the marginal productivity rate. A rise in output prices relative to asset prices lowers the real rate also. This, in essence, is a succinct modern statement of the cyclical changes in real rates. The modern statement would note that reproducible capital must sell at its replacement rate, so the prices of reproducible assets and current production must be brought to equilibrium. von Thunen does not make this argument as far as I know.

von Thunen appears to have recognized clearly the effect of capital gains or wealth on consumption. I will note below that, despite Don Patinkin's statements to the contrary, he was not the first to make a clear statement of the real wealth effect on consumption, although his argument is clear and apparently explicit.

According to Gordon, von Thunen relates the real rate of interest to the demand for money. I cannot follow part of the argument at this point. There are two parts.

The first part states that (p.7) there is diminishing marginal productivity of money held for transactions. The argument appears to rest on a comparison of the opportunity cost of holding commodities (grain) instead of holding cash balances. If cash balances are held, the farmer saves the cost of using wagons and men to transport grain to market during the period when the horse and wagon can be usefully employed on the farm. But if the farmer holds money instead of grain, he still must go to town to make his purchases. The proper measure of resource saved in this case is the difference in costs, if fewer resources are used when money is held.
The first argument does not make the demand for money depend on the real rate of interest. Von Thunen's proposition appears to be an early version of the argument that identifies the productivity of money with the saving of transaction costs. The marginal production of money is highest, according to von Thunen, during the time of year when the opportunity cost of withdrawing wagons is highest -- harvest time. Is this very different from saying that money is portable at lower cost than grain?

The key to Gordon's argument that "at all times the interest rate will equal the least productive yield from a given quantity of money." (p.8) The key to understanding this sentence lies with the terms money and interest. Gordon is explicit in defining money as real balances, but this is true by assumption of fixed prices. Gordon does not tell why the interest rate is the real rate and not the productivity rate. Some clarification here would be helpful.

The second argument tells us that money holders will not leave large sums idle. "They will lend it out until such time as it is needed." (p.9) This appears to be a clear and unexceptionable statement applying the opportunity cost of holding money to the quantity of money. This interpretation is strengthened by von Thunen's equally clear statement that the amount of real balances held depends on the degree of uncertainty. Von Thunen understood that uncertainty raised interest rates and reduced capital values, so the higher interest rate was not a measure of the marginal private product of capital. It was the result of uncertainty, for example during the Napoleonic wars, that drove people to hold money (probably specie in this case) and to sell real capital.

To make the next step -- and it is the crucial step -- Gordon is very charitable to von Thunen. The issue turns on whether von Thunen saw the
equilibrating mechanism that brought the real rate on bonds or loans into equal­ity with the real rate on capital. Gordon makes a very clear statement that "the resulting interest rate is not the rate on bonds and/or notes as opposed to the earnings price ratio of real assets. It is both, and they are presumed to keep in equilibrium relative to one another." (pp. 9-10)

Unfortunately, Gordon does not bolster this statement by references to von Thunen.

I am skeptical for two or perhaps three reasons. First, von Thunen does not set out the mechanism that brings the capital market into equilibrium. That mechanism involves the adjustment of prices of current output, a topic on which he has nothing to say. Second, von Thunen lived through the Napoleonic wars. During the fighting in Europe and particularly in his region of Europe, I would expect an increase in the demand for gold, an increase in the price of consumables, a fall in the price of fixed capital assets relative to the price of current consumption and a rise in quoted interest rates. Gordon's paper gives no reason to believe that von Thunen offers more than a report on the events that he lived through. Good journalism is valuable, but good journalism is not the same as good economic theory.

The third reason is of a very different kind and requires a bit more elaboration. I believe we have to be cautious about 18th and 19th century views that sound like modern Keynesian analysis. The reason is that Keynesian analysis has mercantilist elements, as Keynes recognized in his chapter on mercantilism. The mercantilists clearly related the quantity of money and the rate of interest. Here, in Viner's words, is a summary of the relation some mercantilists believed to hold. (Viner, op. cit. p.31)
"They always wrote of direct employment of capital and of loans at interest in monetary terms, and as a rule they showed no signs that they had penetrated in their analysis beneath the monetary surface. Verbally, at least, they identified money with capital... This is most clearly brought out in the important doctrines of the period: that interest was paid for the use of money, that the rate of interest depended on the quantity of money, and that high interest rates were proof of the scarcity of money, doctrines which were questioned by very few writers before Hume."

I do not suggest that von Thunen was a mercantilist. He may have been better, even much better. I think the case remains to be made, if it can be made.

That Gordon is quick to credit von Thunen with insight both where he does not appear to merit and where he does, comes through clearly. Two illustrations suffice.

Gordon credits von Thunen with a multiplier mechanism. What von Thunen appears to have written, however, is not a description of the adjustment of the economy from one equilibrium to another in response to a change in demand. von Thunen describes the response to a change in labor saving technology that sends the economy into a decline that ends in the starvation or emigration of some workers. This sounds to me much more like some of the less attractive parts of classical labor theory.

A sign of good judgment is the fact that after asserting that a reduction in supply causes inflation, von Thunen crossed out the paragraph. I wish that we could as easily expunge the fallacy that a rise in oil prices is the cause of inflation.
Comparison with Henry Thornton

A few, brief quotations from Henry Thornton will help to place von Thunen into perspective.

First, on the role of confidence and uncertainty and on the demand for money:

"The causes which lead to a variation in the rapidity of the circulation of bank notes may be several. In general, it may be observed, that a high state of confidence serves to quicken their circulation; and this happens upon a principle which shall be fully explained. It must be premised, that by the phrase a more or less quick circulation of notes will be meant a more or less quick circulation of the whole of them on an average. Whatever increases that reserve, for instance, of Bank of England notes which remains in the drawer of the London banker as his provision against contingencies, contributes to what will here be termed the less quick circulation of the whole. Now a high state of confidence contributes to make men provide less amply against contingencies. At such a time, they trust, that if the demand upon them for a payment, which is now doubtful and contingent, should actually be made, they shall be able to provide for it at the moment; and they are loth to be at the expense of selling an article, or of getting a bill discounted, in order to make the provision much before the period at which it shall be wanted. When, on the contrary, a season of distrust arises, prudence suggests, that the loss of interest arising from a detention of notes for a few additional days should not be regarded."

Next on the effect of changes in the stock of money:

"...It is true, that if we could suppose the diminution of bank paper to produce permanently a diminution in the value of all articles whatsoever, and a diminution, as it would then be fair that it should do, in the rate of wages also, the encouragement to future manufactures would be the same, though there would be a loss on the stock in hand."
The tendency, however, of a very great and sudden reduction of the accustomed number of bank notes, is to create an unusual and temporary distress, and a fall of price arising from that distress. But a fall arising from temporary distress, will be attended probably with no correspondent fall in the rate of wages; for the fall of price, and the distress, will be understood to be temporary, and the rate of wages, we know, is not so variable as the price of goods. There is reason, therefore, to fear that the unnatural and extraordinary low price* arising from the sort of distress of which we now speak, would occasion much discouragement of the fabrication of manufacturers.

Note that in this single paragraph Thornton not only distinguishes between temporary and permanent changes in the price level, he clearly notes that wages are rigid -- in response to temporary fluctuations in output -- and are flexible in response to permanent changes in money and prices. Further, he recognizes the wealth effect of a change in the price level when he refers to "the loss on the stock in hand." But Thornton does not stop with the recognition of the reason fluctuations are induced by changes in money, he goes on to add why equilibrium is restored. In a footnote to the paragraph, Thornton writes:

"...The general and permanent value of bank notes must be the same as the general and permanent value of that gold for which they are exchangeable, and the value of gold in England is regulated by the general and permanent value of it all over the world; and, therefore, although it is admitted that a great and sudden reduction of bank notes may produce a great local and temporary fall in the price of articles (a fall, that is to say, even in their gold price, for we are here supposing gold and paper to be interchanging), the gold price must, in a short time, find its level with the gold price over the rest of the world. The continuance of the great limitation of the number of bank notes would, therefore, lead
either, as has already been observed, to the creation of some new London paper, or possibly to some new modes of economy in the use of the existing notes: the effect of which economy on prices would be the same, in all respects, as that of the restoration of the usual quantity of bank notes..."

Thornton's writings were available in German as early as 1803.