The Difference Between Market and Barter: Money and the Making of Markets

2

Market is in many respects distinct from barter. This distinction needs to be emphasized, because the conventional theory treats market and barter erroneously as the same.

Barter is essentially bilateral in nature. It requires the reciprocity of supply and demand. The supplier has to demand the good that the demander of his goods offers and vice versa. Further, when both—the supplier and the demander—have found an exchange partner, they still have to agree on the relative price which both can accept. This is a disadvantage, because for every new exchange a new price has to be found. Competition, and hence the efficiency of economic activity, is therefore restricted in two ways. First of all, there is the difficulty in finding a suitable exchange partner. Secondly, since the prices are necessarily expressed in different (real) units, parties cannot compare systematically across a range of supply and demand the prices and in this way look for the cheapest supplier or the best bidder.

On the other hand, barter has the advantage that, if an exchange takes place, demand and supply are always in equilibrium, and consequently the earnings and the expenditures of the exchanging parties are equal. This follows from their agreement on the relative price, without which there would be no exchange. *If* there is an exchange at an agreed price, then the value of whatever is supplied matches the value of what is demanded. For example, if apples and pears are exchanged and the agreed relative price is 2 kg of apples are worth 1 kg of pears, one of the parties gives up at this relative price 100 kg of pears and receives from the other party 200 kg of apples. For him therefore

$$100 \, \text{kg pears} \times \frac{2 \, \text{kg apples}}{1 \, \text{kg pears}} = 200 \, \text{kg apples}.$$

The other exchanging party gives at this price 200 kg of apples for 100 kg of pears. And so for him

$$200 \, \text{kg apples} \times \frac{1 \, \text{kg pears}}{2 \, \text{kg apples}} = 100 \, \text{kg pears}.$$

This means that at the relative price at which supply and demand are equal, earnings and expenses for both partners are also equal.

This is different in a market. Since the supply of a good is equal to the demand for money and the demand for a good is equal to the supply of money, the prices are money prices or absolute prices and therefore comparable. These money prices are the result of supply by many and demand by many. But, in contrast to barter, there is no necessity that earnings and expenses of individual market participants and supply and demand always match. Every individual, if he wishes to avoid being in debt, has only to make sure that he does not spend more money today than was earned before and has now in his hand. Whether this is the case is quite independent of whether there happens to be an equality of supply and demand in the market. By contrast with barter, trading in the market—buying and selling—occurs independently of the solvency or insolvency of individual participants or whether prices have managed to match supply to demand. Equilibrium is not a precondition for trade!

If we therefore compare market and barter, we can first of all say that the market is efficient, while barter is not. Secondly, while barter is necessarily always in equilibrium, the market is not.

Léon Walras, the founder of the neoclassical theory on which the conventional theory still rests, refused to recognize this conclusion. This was because he wanted to prove that the market process, if allowed to develop unimpeded, was capable not only to efficiently coordinate the plans of individual agents through the price mechanism but would also lead to a *general* equilibrium in which at each moment the expenditures of all parties were matched by their earnings. This would mean that they only spent what they simultaneously earned. To persuade those who doubted this, he was convinced that economics had to be put on a mathematical basis.[1] This can be presented in a much more elegant fashion if based upon a model of barter in which all actions occur simultaneously, rather than upon a market model in which time-dependent disequilibria have to be taken into account.

To this end Walras constructed a mathematical model for a quasi-market process which combined the advantages of barter—the constant realization of general equilibrium—with those of markets—the realization of efficient competition based upon a single market price for each good.

This model rests on the multilateralization of barter, such that instead of two exchanging parties with two goods, there are n exchanging parties with m goods. The exchanging parties are, as in bilateral exchange, independent "households," that is, economic agents which are engaged in production and consumption and are primarily self-sufficient, which only exchange what they do not themselves consume. Such exchanging parties can be understood to use the image favored by neoclassical theory, as many Robinson Crusoes who, instead of living in an isolated

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[1] See Günther Hesse (1986, p. 81). He summarizes a report in which Walras describes himself how he came to formulate his theory mathematically. Hesse referred to Walras (1936, p. 466). The relationship of Walras to mathematics is dealt with in greater detail by Andreas Jäger (1999).

island, work on farms, which border each other.[2] Hence, they are able to engage in a common "marketplace." The quantity of exchangeable goods is in Walras's view fixed and less than would be demanded if the price were zero. They are, as a consequence, always limited relative to wants, that is, they are scarce.

This model was extended by Walras to include the factors of production. Since their prices are derived from the price of the products, and the factors of production and the products are exchanged simultaneously, so their respective prices are simultaneously determined. This model implied that production required no time, that is, that time is of no consequence. In this case, the scarcity of the factors of production can simply replace the scarcity of goods. Therefore, the quantities of factors of production rather than the quantities of goods are treated as given. That the supply of production factors might be extended as a *result* of the market process is ruled out.

One can think of this quasi-market as organized in the following way, as Walras himself indicated. Once a week, say on Monday, there is a market (see Patinkin 1965, 4 ff.). All "market participants" meet up on a marketplace, in the middle of which there is an auctioneer. The auctioneer selects a standard good or *numéraire*. The prices of all goods are expressed as their exchange ratio with this good. If the *numéraire* is wheat, then the price of apples is the quantity of wheat that is received for 1 kg of apples. Prices are hence always relative prices expressed in relation to the standard good which itself exchanges one for one, and so its relative price is 1. Instead of a particular standard good, it is also possible to choose an "average good," or a basket of goods, in which there is one nth of a unit of all n goods. One unit of the basket of goods therefore exchanges likewise at 1:1.

The "market" process begins with the auctioneer arbitrarily naming a price (*crié au hasard*) for each good including the factors of production, which is the same for all "market" participants. The auctioneer asks then the participants to name the desired quantities of goods to be demanded or supplied at this price. He sums up all these quantities when he has had the relevant responses. The auctioneer will then presumably establish that at the arbitrary price for one good demand exceeds supply, while for another good the supply exceeds demand. Where the demand is too great or the supply too small, the auctioneer will in the second round raise the price, and where the demand is too small or the supply too great, the price will be reduced. This process will continue until for every good or production factor, there is an equilibrium of supply and demand. To equalize earnings and expenditure, each independent economic unit must make its own calculation that conforms to the "exchange equation," which requires that for all transactions of an independent economic unit completed on that Monday, there is an equality of earnings and expenditures. Only at these equilibrium prices are the goods and products exchanged. And so with the help of the auctioneer, a bilateral barter is transformed into a multilateral barter. It is of decisive importance that in this model, the main

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[2] The metaphor of Robinson Crusoe was introduced by Eugen von Böhm-Bawerk (1889, p. 109).

feature of bilateral barter is maintained: All prices at which transactions are undertaken are equilibrium prices. No transactions take place outside equilibrium!

Equilibrium means:

Firstly, the supply of *each* good is equal to the demand (market equilibrium).

Secondly, the earnings for *every* economic unit equal its expenditures (exchange equilibrium).

Walras found it necessary to reduce a market economy to a barter economy since in the process of barter time stands still for as long as negotiation takes place. There is therefore no need to take account of disequilibria which might put into question the consistency of the system. During the process of negotiation, all prices and quantities are only calculated entities and so open to revision. During this suspended "time," the economic units calculate the optimal use of goods on the basis of their preferences, taking account of the "exchange equation." Given the role of the auctioneer, perfect information prevails. At every moment every partner knows what will be received in return for a good. Therefore, it does not matter whether one negotiates on the basis of prices or of quantities. The result is the same.

Exchange is only completed if the parties to it agree on the equivalent values of exchanged goods, in other words, on the (relative) prices. Once this has happened, there is no further reason for the revision of the plans for supply or demand, but only a reason for their repetition. New adjustments are made only because of exogenous changes.

The Walrasian model of general equilibrium that represents multilateral barter is constructed as an analogue of the situation of bilateral barter, namely:

- The "conversation" between the auctioneer and the exchange partners constitutes the phase of negotiation that precedes each barter and during which time is "frozen."
- General equilibrium describes the situation after the end of negotiations, when the goods are handed over.
- The number and quantity of exchangeable goods or production factors is given a priori; they are simply a "legacy" of the past and have not to be further analyzed.

In this model, money functions only as a means of calculation and at the most additionally as a store of value.

A model of this kind can be formulated as a system of simultaneous equations in which all relative prices and quantities supplied and demanded are simultaneously explained.

Walras set economics off down the wrong track with his idea of general equilibrium, not because he set up a "pure theory" or a simplified model—such simplification is perfectly admissible in seeking to explain how barter works—but because the market economy is a money economy, not a barter economy. The creation of a "market" around an auctioneer, involving millions of "market" partners and millions of goods, is conceivable, but not feasible. That much is immediately apparent. The transition from bilateral barter to the multilateral market occurred not through the extension of barter to ever more partners and goods, but instead through the *substitution* of barter by payment with money.

The substitution of barter by money makes possible the emergence of efficient markets for each good or production factor tending to a single unique market price for each good or production factor. No longer is it necessary for earnings and expenditures of each individual economic unit to be at all times in equilibrium. Of course, in this case, the market cannot eo ipso guarantee on optimal coordination of individual plans under *given* conditions. But it possesses instead a dynamism that tends to *alter* given conditions by extending the scope for economic activity. Insofar as money is a "temporary" good which possesses value by virtue of it being spent at a *later* point in time on a good that one would like to have, or which is invested so that at a *later* point in time one might receive more money, it gives time both for promoting either a convergence between supply and demand within a *given* framework *or* preventing such convergence by actively *altering* the given framework. This means that market and competition not only coordinate but also lead the economy into constant forward motion. Whether convergence or forceful stimulus dominates depends on the options available to the firms.[3]

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[3] It should be noted here that a clear distinction has to be made between the dynamisation of economic theory through the inclusion of money and the "dynamization" of Walrasian equilibrium on the part of Arrow and Debreu (1954), Debreu (1959), and Arrow and Hahn (1971). Arrow and Debreu do start out from the principle that there is a market not only for present but also for future goods. To this extent they do include time. However, trading in the market for future goods occurs in just the same way that trading in the market for present goods. These markets "'telescope' the future into the present" (Arrow and Hahn 1971, p. 33). The prices of all present and future goods come together into equilibrium in the present simultaneously. This excludes any genuine dynamics resulting from the successive variation from period to period of the quantities of resources employed and the composition of goods, both of these variations being the outcome of the actions and reactions of competitors in a historical process. The "dynamic" of Arrow and Debreu is a pseudo-dynamic. It remains stuck in a static model. Mark Blaug commented on the formalism of Arrow and Debreu as follows: "The Arrow–Debreu paper was devoted to a rigorous proof of the existence of a competitive general equilibrium of prices and quantities for a world in which commodities are produced and sold in every possible period and in all possible circumstances. . . . It employed set-theoretical mathematical techniques and the then relatively new theory of games and was almost immediately hailed as the alpha and omega of mathematical economics. . . . It took years if not decades to recognize that such a proof for a hopelessly abstract economy, however accomplished as an exercise in mathematics, teaches almost nothing about the substantial operation of a market economy; it is empirically empty" (Blaug 1999, p. 271).

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