Equilibrium Concepts and the Entrepreneur

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This article explores the implications of the entrepreneur for equilibrium concepts. It is argued that the focus in economics should be on the process towards equilibrium instead of end states when all processes have ended. The concept of equilibrium cannot adequately deal with entrepreneurship since the latter not only coordinates but also discoordinates the economy. Entrepreneurship can be more readily accommodated by the concept of spontaneous order, since it does not rely on the concept of equilibrium.

INTRODUCTION

In a dynamic economic system, the forces making for equilibrium are those making for the complete integration of the complementary factors of production into the structure of production. The forces making for disequilibrium are those which disrupt this process towards complete integration. The forces of equilibrium and disequilibrium are closely linked to entrepreneurship. It is entrepreneurs who shape and mould the structure of production. In this process they accumulate capital, coordinate various stages of production and create new production structures. With the rise of Walrasian modes of thinking, theorists came to see entrepreneurship as something to be abstracted from since "they constitute phenomena that obstruct theoretical vision of that underlying equilibrium set of potential activities that is alone fully consistent with the basic data, consumer tastes, resource constraints, and available technology" (Kirzner, 1985: 4). It became fashionable to view the real world as being close to equilibrium, and so fully coordinated that entrepreneurs made neither profits nor losses. Any discrepancies between the real world and equilibrium were not due to disequilibrium but rather reflected "complete adjustment to some overlooked real circumstances" (Kirzner, 1985: 4).

Since the 1970's, with the economics of general equilibrium fully developed, attention has been turned to facts not easily fitting into the equilibrium mould (Kirzner, 1985: 5). This has led to attempts to resurrect the entrepreneur in order to explain disequilibrium. It is argued below that entrepreneurship can be accommodated in macroeconomics only by incorporating capital theory. In this process the views of the Austrian school of economics are greatly utilised.

THE STRUCTURE OF PRDUCTION

Acts of production bear a fundamental relationship to the prospective acts of consumption which it makes possible. The value of capital goods is systematically related to the value of goods being produced and the time separating them. The process of production can be perceived as a sequence of stages of capital goods and complementary factors of production. Accounting for all the production processes throughout the economy defines the economy's structure of production. Menger (1976: 55-58) visualised

the structure to be 'vertical'. Stages of production close to final consumption are referred to as later, lower-order or final stages and stages more remote from final consumption as earlier, higher-order or first stages of production. The first stage of production is the point where a new enterprise actually begins. For example, in the case of bread making, the first stage is when the wheat is planted (Skousen, 1990: 150 - 153).

The structure of production can also be defined in terms of the value of the capital goods employed at each stage of the production process, and the aggregate production time associated with the processes. The capital goods constituting a given stage have both a value (measured in money) and a time dimension. In a dynamic economy, conditions such as consumer demand, resource availability and technology are always changing. Patterns of productive activities have to be continuously adjusted to these changes. When market conditions change, producers react. The actions of producers are not independent of each other and the interrelationship of these actions lead to a continuous process of adjustment until all actions are mutually consistent and comply with the new conditions. It is important to realise that changes in market conditions further involve creative activities by entrepreneurs bringing about new products or innovations. Entrepreneurs do not only react to changes in market conditions but also create some of these changes.

Since the structure of production consists of various stages of production standing in various relationships with final consumption, adjustments to changing market conditions involve inter-temporal adjustments and coordination. The issue of inter-temporal coordination concentrate on whether and how desired patterns of consumption in the future can be transformed into desired patterns of production in the present, and the extent to which they coordinate. Various institutional arrangements and alternative government policies will either foster or hinder these processes of inter-temporal coordination.

The capital goods making up the various stages of production are mostly heterogeneous in nature and of various degrees of specificity (Van Zijp, 1993: 17). Changes in patterns of production leading to restructuring of production are impaired by these characteristics. Capital goods can only be transferred from one stage to another with great difficulty. If all capital goods were completely homogeneous by nature, they could then be employed during any stage of production. Capital goods would then be completely substitutable for each other. In a situation such as this there would be no problem of restructuring when market conditions change. If more capital goods are required during the later stages they can quite readily and quickly be obtained (substituted) from earlier stages. The economy will be closer to the timeless general equilibrium model since no dis-coordination exists between the stages of production. On the other hand, if capital goods are completely specific to each stage, no such restructuring can ever take place and dis-coordination will persist for longer periods of time.

In reality, capital goods are related to each other, some as substitutes (implying various degrees of heterogeneity in use) and some as complements. The economic significance of the heterogeneous nature of capital goods lies in the fact that each capital good can only be used for a limited number of purposes. Each capital good is devoted to what is expected to be its most profitable use at every moment. Changing circumstances change these expectations, and the original plan in which the capital good is meant to play its part goes astray.

Most production processes require the joint use of capital goods. The heterogeneous nature of capital goods implies that capital goods do not lend themselves to combinations in any arbitrary fashion. Only certain modes of complementarity are technically possible with only a few of these being economically viable. The best mode of complementarity is not given knowledge; it must be discovered by entrepreneurs or social planners. Allowing for both intertemporal (between stages) and a-temporal (same stage) production, substitutability and complementarity results in a complex structure of production made up of a wide assortment of capital goods. General equilibrium could only prevail if all the different stages were completely coordinated.

COMPLEMENTARITY AND SUBSTITUTABILITY

In reality, capital goods are substitutes for some and complements for other goods. Furthermore, the capital goods themselves stand in a complementary and substitutable relationship with the other factors of production. Factor complementarity presupposes a plan within which each factor of production has a function (Lachmann, 1977: 203). The issue of factor complementarity can only be addressed in respect of

a plan such as this. Factor complementarity is a static phenomenon since the complementary relationship between the factors of production is fixed as long as the plan remains unchanged. Lachmann (1978: 58) refers to this as "plan complementarity". Plan complementarity is brought about directly by entrepreneurial action.

In an economy-wide sense, structural complementarity is indirectly brought about by the market, *viz*. by the interplay of individual entrepreneurs' plans (Lachmann, 1978: 58). Only when the utilisation of plans succeeds, and capital goods stay where they are in the structure of production, can the capital structure be defined. Any new factor thereafter merely joins the existing capital structure without altering the existing coefficients of production. This requires the ends to change in such a way as to leave the capital structure intact and optimal. The capital structure can then, and only then, be defined in terms of the constant composition of capital combinations and service streams. Economy-wide equilibrium implies that the acts of all individuals, producers and consumers are consistent with each other, and thus all production plans. In other words, it implies complete structural complementarity with the structure of production being completely integrated. This implies that the profit rates are the same for all the stages of production.

While factor complementarity implies the absence of change, substitution is a phenomenon of change. "Substitutability indicates the ease with which a factor can be turned into an element of an existing plan" (Lachmann, 1977: 200). The factor may have been taken out of another plan, may have been temporarily unemployed, or it may have been newly created. Substitutability also refers to the ease with which different ends can be pursued. "The economy can easily accomplish the old alchemist's dream of transforming lead into gold by simply shifting the labour, machinery and managerial skills used to make lead into the production of gold instead" (Sowell 1980: 49).

Every major change in the economy will upset some plans and disrupt some complementary relations. The incompatibility of plans will induce entrepreneurs to change them. These changes must be unforseen otherwise they would already have been taken into account in the *ex-ante* plans of entrepreneurs. If such unforseen changes occur, substitution of factors ensues. The process of factor substitution will destroy one set of complementary relations in the creation of another. The coefficients of production have to be altered which will have repercussions throughout the economy as they entail further acts of substitution in other firms. The process will end once the system is in equilibrium in terms of overall structural complementarity and consistency of plans. The structure of production will then again be completely integrated.

As seen above, the complementarity of plans is an equilibrium concept. Any tendency towards equilibrium is therefore a tendency towards the integration of factors of production into a complementary plan. General equilibrium will prevail when all tendencies towards integration have taken place with overall structural complementarity and consistent plans being achieved. The mere fact that this is never achieved is due to the superior strength of the forces making for disequilibrium. The focus below is on these forces of disequilibrium.

THE ENTREPRENEUR AS COORDINATOR IN THE MARKET PROCESS

Complementarity and substitutability in the production structure allow for the forces making for equilibrium and disequilibrium. Both forces are due to entrepreneurship in the process of profit seeking. The general equilibrium concept is only useful in explaining the unlikely situation of complete plan compatibility. The market process can be viewed as being propelled by the simultaneous activity of arbitrage (buying low/selling high), accumulation (or decumulation) and innovation as its driving forces. Entrepreneurial activity appears in all three of these activities (Kirzner, 1985: 84 - 85).

Arbitrage activity consists of acting upon the discovery by the entrepreneur of present or a-temporal discrepancies between the prices at which a given item can be bought or sold. In other words, it is a situation of disequilibrium being acted upon. In this type of disequilibrium there is unlikely to be just one price existing for an item. Some buyers are paying higher prices than others. Some sellers are accepting lower prices than others. Other sellers are unable to sell anything because their prices are too high to attract any customers. The unequal prices and the frustrated plans are the result of a lack of knowledge about the plans and actions of others. The entrepreneur's activity, in the form of arbitrage activity, pushes this chaotic situation towards coordination. The entrepreneur is alert to the profit opportunities brought

about by these discrepancies. By buying low and selling high these opportunities are exploited. Successful entrepreneurial action attracts attention and imitation, eliminating more and more price discrepancies until a fully coordinated market is achieved. It is arbitrage activity which moves the economy towards equilibrium. The Marshallian adjustment mechanism (quantity adjustment) and the Walrasian adjustment mechanism (price adjustment), as taught in traditional microeconomic textbooks, assume that only one price exists in situations of disequilibrium. Profit opportunities are assumed to be universally perceived and acted upon. There is no role for the entrepreneur in either of these mechanisms, suggesting an almost mechanical adaptation to disequilibrium (Baird, 1982: 13 - 17).

Speculative activity involves arbitrage activity over time and is thus intertemporal. The entrepreneur believes that discrepancies exist between the price of an item today and its price in the future and that an opportunity for pure gain has been discovered. In buying when prices are low (at present) and selling when they are high (in the future) successful speculators make gains. This process actually decreases price fluctuations in the economy, bringing about coordination between present and future production and consumption. "Destabilising speculators are, of course, a logical possibility; they can be recognised by the red ink in their ledgers" (Friedman, 1990: 379). Speculative activity involves the bearing of uncertainty by entrepreneurs and the gains of such activity could be seen as compensation for the undertaking of these risks. Furthermore, speculative activity serves to coordinate and bring about equilibrium in the market. Baird (1982: 329 - 340) and Friedman (1990: 377 - 389) provide additional examples of the coordinating role of speculative activity.

Innovative activity consists in the discovery of a product, and the discovery of a method of production or organisation not in use until now. Innovations take place because of intertemporal price discrepancies. In this sense it has elements of speculative activity. Both types of activities have important parallels with arbitrage activity. Thus, arbitrage will take place if new opportunities are supplied and innovation occurs. Many actions of arbitrage can only be executed if production and investments take place, that is if accumulation takes place. Accumulation also relates to arbitrage. The buying and selling of products for speculation implies that accumulation must take place. Accumulation comes to an end if no new innovations occur, while innovations are diffused by means of accumulation. These driving forces cannot be isolated from each other because they are part of the same market process.

Innovation can lead to dis-coordination as well as coordination in the market. Schumpeter identified innovation as one of the principal promoters of economic change (Reekie, 1984: 49). Schumpeter's entrepreneur moves the economy away from equilibrium by means of 'creative destruction', while arbitrage and speculative activities move the economy towards equilibrium and planned compatibility. The entrepreneur is the power behind the forces of arbitrage, speculation and innovation. In a dynamic economy these forces are simultaneously active due to the actions of different entrepreneurs.

It is innovation which, in a capital theoretical context, destroys previous complementary relations in the production structure ('creative destruction'). This could be in the form of a new product, based on the expectations of satisfying wants not satisfied by existing products. It could also be in the form of a new way of organising existing production activities or a new method of production. The innovation changes existing complementary relations between different plans in the structure of production. A new production structure evolves, based on the expected profit opportunities created by the innovation and the accumulation of factors needed for its production. Innovation destroys existing patterns of production while arbitrage and speculation encourages the integration of the structure of production. The actions of entrepreneurs on disequilibrium prices, in exploiting the resulting profit opportunities, is an important part of entrepreneurship (Baird, 1982: 16; Shand, 1984: 84; Kirzner, 1985: 60). These actions encourage the creation (innovation) and integration (arbitrage and speculation) of the structure of production. As these actions occur with the passing of time and as the future is uncertain, the problem of intertemporal coordination has to be addressed.

The question must be asked as to what extent market forces and the evolution of such forces, can lead to coordination between the plans of the individual actors in the market. At the same time the issue must be addressed as to whether the forces making for order (equilibrium) will be stronger than those making for disorder (disequilibrium).

The real economy cannot be depicted by using a general equilibrium framework. General equilibrium abstracts from time and money and would only prevail in the special case where complete integration of the structure of production has taken place. Rejecting the general equilibrium framework does not imply

that there is no existing tendency towards the complete integration of the structure of production and order. The principle of "spontaneous order" as developed by Hayek (1990: 83-84) can be used to allow for the fact that "a tendency towards the integration of the [capital] structure does exist" (Lachmann, 1976: 159). Allowing for a tendency towards the integration of the structure of production is to allow for an ordering process in the economy which is never really in equilibrium. This order is spontaneous since it is based on the exploitation of profits evolving from disequilibrium situations in the market without "any formal machinery for enforcing them" (Sugden, 1989: 86). This ordering process is characterised by the creativity of entrepreneurship, complexity flowing from the further division of labour and the coordinating influence of money (Boettke, Horwitz & Prychitko 1994: 66 - 67). Debates on the merits of stabilisation policies will then be concerned with whether these tendencies towards the integration of the capital structure are strengthened or weakened by such policies (O'Driscoll, 1978: 111 - 142). Any policy weakening this process will lead to greater dis-coordination in the economy.

THE ENTREPRENEUR AND THE PROCESS OF SPONTENEOUS ORDER

The entrepreneur, as manipulator of the process of arbitrage, accumulation and innovation, is the driving force shaping and recreating the productive structure of the market. The factors of production are heterogeneous with regard to their use, their values being subjectively determined by entrepreneurs given their different expectations of the future. These values are continually changing as conditions in the economy change. The existence of a spontaneous order depends on the nature of institutional arrangements. As long as these arrangements are such that expectations and actions of entrepreneurs are rewarded, consistent with underlying economic realities, and inconsistencies penalised, a tendency towards a spontaneous order can be expected to prevail.

Disequilibrium, in an intertemporal setting where existing plans are not compatible, means that opportunities exist for entrepreneurial profits. If the institutional arrangements allow for the grasping of these profits arising from disequilibrium, a tendency towards equilibrium and a spontaneous order will occur. For example, if house building is being heavily subsidised so as to promote the building of more houses but the manufacturing of cement is severely regulated, builders' plans will not be compatible with those of cement manufacturers. The likely outcome will be a sharp increase in the price of cement and house prices. The profit opportunities will continue as long as the regulations are in place, with entrepreneurs unable to remove the prevailing disequilibrium.

Institutions such as property rights and money, which are important for a spontaneous order in the market, have evolved from the market as the result of past human actions. "They serve as behavioural guides that reduce the knowledge and cognitive skills necessary for successful action" (Langlois, 1986: 246). These institutions are continuously being reshaped, due to the efforts of "agents to coordinate their activities" (High, 1986: 116). High (1986: 116 - 118) recommends an evolutionary view of institutions in the market. The evolution of money, organised markets, specialised traders and producers, advertising and property rights are all due to efforts towards greater coordination of activities and the removal of uncertainty. These are the products of disequilibrium. Under general equilibrium a situation of complete certainty would prevail with the evolution of institutions to remove uncertainties being unnecessary.

Nelson and Winter (1982) view firms as if they are generated by an evolutionary process. Existing firms are explained by prior adaptations to the environment. The entrepreneur disturbs firms' routines by changing the economic environment (structure of production). Conscious entrepreneurial adaptation to the changing environment is important for survival and can result in a new routine and organisational form.

Alchian (1950: 211 - 221) emphasises the imitation of successful enterprises so as to allow the imitators to make profits and to survive. These imitations afford relief from the necessity of making decisions and conscious innovations in an uncertain world. By these actions, greater coordination is achieved by removing disequilibrium and making plans more compatible. These processes of imitation can lead to new innovations if the processes reveal new and better methods than the ones being imitated.

As long as a world of evolution and uncertainty is sustained, the market process will be propelled by the concerted action of arbitrage, accumulation and innovation. Uncertainty of the future leads to the significance of expectations. It is the diversity of expectations which produces a heterogeneous state of affairs. A selection order is generated by the market whereby the 'more' correct actions will be rewarded

and imitated. Thus, there is a discovery process due to disequilibrium prices arising from the diversity of expectations. This leads to a learning process and eventually a diffusion of knowledge as successful behaviour is imitated.

In the context of a dynamic market economy there is no reason to expect that all expectations will be uniform. Successful and unsuccessful actions occur at the same time. It is the selection process generated by the market that ensures that a tendency towards more successful actions (equilibrium) would prevail. According to O'DriscolI and Rizzo (1985: 180), it is the greater uniformity of expectations that explains the 'clusters' of errors which constitute the downturn of the business cycle. They believe that there is no reason for entrepreneurs to be systematically in error and that theorists must look outside the market for an explanation of these 'clusters' of errors.

DISEQUILIBRIUM, FALSIFIED PRICES AND NON-PRICE SIGNALS

Thus far the focus has been on the role of the entrepreneur in removing disorder from the market and, in so doing, makes for a greater coordination of plans (a spontaneous order). During this process, prices have an important role in acting as guideposts for the entrepreneur. Prices are important signals in the transmission of information to entrepreneurs in particular and society in general. Prices provide useful guides or signals, if they are allowed to function, because they reveal discrepancies and errors (disequilibrium). These "'incorrect'(i.e. disequilibrium) market prices provide incentives, in the form of pecuniary profit opportunities, to the discovery of better alternatives by entrepreneurial agents" (Thomsen, 1992: 55). Prices would actually become redundant in a world where they are always 'correct' in the sense of being at their equilibrium levels. Even the future would be known since intertemporal coordination would also prevail. On becoming redundant, prices could be replaced by a central processor of information such as the Walrasian auctioneer, issuing production orders allocating goods and services (O'Driscoll & Rizzo, 1985: 105). The entire economy could then be centrally planned.

Prices reveal discrepancies, previous maladjustments and errors. They further reveal for instance, what people require relatively more urgently now and in the future (time preference). Prices also reveal the processes of search entered into by entrepreneurs in trying to discover the correct prices for their products (profit making). Disequilibrium prices convey information indicating that something is wrong and that disequilibrium exists. They convey information indicating that individual plans and expectations are inconsistent with those of others. Even though these errors are reflected by prices, the direction, whether prices are too low or too high, is not. This will require interpretation of prices. "Here knowledge derived from price messages become problematic. It does not cease to be knowledge, but 'does not tell the whole story'..." (Lachmann, 1978: 21 - 23). The dilemma of price interpretation is a fundamental problem of conditions of disequilibrium.

The entrepreneur provides the solution to this dilemma through the selection process of the market. Entrepreneurs who are best able to interpret and act upon disequilibrium prices will be rewarded by greater accumulation and growth in the market. Prices and markets function as part of a social system which also generates many non-price variables. Markets are composed of contracts, rules and customs which are part of the constraints and a basis for observed behaviour. These constraints are often necessary accompaniments to markets. For example, a price system devoid of property rights is impossible to imagine. "Not price but people allocate resources, and flesh and blood human actors depend on all the non-price variables in their decision-making" (O'Driscoll & Rizzo, 1985: 106).

These non-price variables or signals define the 'rules of the game' and serve as reference frameworks and orientation points which form the basis for individual plans and expectations. They are important in determining the types of actions generated by the market and, as seen above, have evolved from the market to remove uncertainties. Prices are the outcome of the interaction of people in the market which, together with these non-price variables, influences their decision-making. Thus far the focus has been on disequilibrium prices as conveyers of information and as such they create the potential for market coordination by entrepreneurs. These prices are generated by the market and reflect the outcome of individual plans.

It is, in addition, important to distinguish disequilibrium from falsified prices. Disequilibrium prices generate responses by entrepreneurs who tend to remove them. These are the equilibrium tendencies which lead to the integration of production plans with the ever changing production structure of the

economy, further leading to a spontaneous order. The selection process of the market ensures that those who are more competent in the removal of disequilibrium will be rewarded and will experience greater growth.

Prices are falsified if they are interfered with in such a way that responses are generated which no longer reflect the underlying realities of the market. The most likely force able to achieve this on a permanent basis is government. Government has the power to falsify prices via subsidies, taxation, price controls, rules etc. By falsifying prices, responses are generated which change the economy's structure of production. In the presence of falsified prices, resource utilisation, plans, expectations and entrepreneurial activities are increasingly shaped by the contents of government policy and not by the underlying market realities. Decision making is increasingly left to bureaucrats and rentseekers (agents making profits by using the political market) rather than profit seekers become relatively bigger accumulators.

The entrepreneur, acting upon and creating disequilibrium prices, serves to bring about a spontaneous order and intertemporal coordination. The role of the entrepreneur is to move markets, including labour markets, in the direction of perfect coordination (Bellante 1990: 156). It is the entrepreneur who establishes the production structure on which macroeconomics is founded.

CONCLUSION

The entrepreneur, acting upon and creating disequilibrium prices, serves to bring about a spontaneous order and inter-temporal coordination. The role of the entrepreneur is to move markets, including labour markets, in the direction of perfect coordination (Bellante, 1990: 156). It is the entrepreneur who establishes and continuously reshapes the production structure on which macroeconomics is founded.

Entrepreneurship allows us to escape from the Walrasian boxes on which so much of contemporary Economic theory rests. It urges a focus on the process towards an equilibrium which, in a dynamic economy, is for all practical reasons never achieved as new profit opportunities are created and existing opportunities decline. Allowing for entrepreneurship is to allow for a spontaneous order in the market economy and it questions the possibility of central control of the economy as the foundations of the latter is found on equilibrium concepts.

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