

# Can economics be free from the neoclassical market doctrine?

*"It is a peculiar fact that the literature on economics ... contains so little discussion of the central institution that underlies neoclassical economics-the market." North (1977, p.710).*

## Abstract

One of the decisive part of the works of Kornai János is the critique of General Equilibrium (GE). This criticism is also a critique of the neoclassical market concept, since the equilibrium theory is based on the abstract, idealized market operation. His book *Anti-equilibrium* published in 1971 has not provoked a stir in the seventies, however, new economic schools popping up in the eighties and nineties leveled increasingly strong criticism at the equilibrium doctrine of mainstream economics.

The goal of this presentation is threefold: firstly, to show that Kornai's criticism about market operation formulated by the neoclassical economics is still valid today. Secondly, to demonstrate what extent the subsequent criticism followed his methods (critical attitudes). Thirdly, to examine how his general economic system analysis can be found later in the non-mainstream economic theories.

The general equilibrium theory is based on the neoclassical market view. Neoclassical economists, however, have never described the market in detail, as North wrote in the above citation. Obviously, not because they should have faced the fact that the market is not a simple automation, in which one I put in demand and supply at one end and the price comes out at the other end. The market can not be considered as a self-regulating system whose operation can be simply described and modeled with the Marshall Cross. The market is a complex operation system operated by flesh-and-blood people, which can take a lot of specific forms in space and time.

Kornai, in his book *Anti-Equilibrium*, published in 1971, thoroughly criticized the simplified, abstract market concept of neoclassical economics and the equilibrium doctrine based on it. His book contained not only the critique of general equilibrium theory, but also a positive expression: he tried to replace the criticized theory with a general economic system description. Criticism and positive expression, while form-

ing an organic unit in the book, can be logically separated and assessed separately. What is more, we focus primarily on the criticism of the neoclassical approach and deal with the economic system description only tangentially. The purpose of this lecture is twofold. Firstly, to show that Kornai's criticism of the neoclassical theory of the market system is still valid. Secondly to analyse whether over the past 45 years the criticisms of the neoclassical/new classical (mainstream) concept of the market has advanced in Kornai's path or if it has taken a different approach.

In *Anti-Equilibrium*, Kornai focused on the abstract conditions of general equilibrium theory: static, deterministic, simultaneous operation, rational behavior of producers and consumers, and the exclusivity of price information. He made critical considerations regarding the interpretation and use of the eight principal neoclassical concepts (preference, utility, optimum, demand, supply, price, profit, equilibrium). Reflecting on these topics, four chapters of the lecture emerged: 1. Equilibrium paradigm, 2. Space-time, path-dependence, 3. Rational behavior, non-price control, 4. Economic law and social embeddedness.

## Equilibrium paradigm versus non-ergodic economic operation

The mainstream economic school, the new classical/new Keynesian synthesis is still static, stationary. There has been no breakthrough in general dynamics, although there are dynamic, non-equilibrium models, especially among growth models and crisis models. The basic model of the new classical school is the RBC (Real Business Cycle) model, which is based on a general equilibrium basis, assuming the existence of flexible market-clearing prices, the neutrality of money and, consequently, the ineffectiveness of monetary policy. Due to the assumption of Ricardian equivalence (namely, that new government expenditure is automatically offset by private savings), fiscal policy is also not effective. Consequently, only random shocks can temporarily divert the economy from its long-run equilibrium (trend) path.

No major breakthrough on this front was brought about by the new classical/new Keynesian compromise, and neither the new neoclassical synthesis, with its flagship, the DSGE model family. Although, the name Dynamic Stochastic General Equilibrium suggests that it's a dynamic model, this model is in fact not dynamic. Both RBC and DSGE were designed by "quasi-dynamising" the static Solow-Ramsey growth model. The exogenous technological shocks externally move the equilibrium over time and draw the equilibrium path, thus trying to dynamise the process, this can however at best be considered as a stationary model. There is no real internal dynamics of this model that would result from the interaction of factors. In essence, the DSGE model differs from the RBC only in that the former allows prices not to be market-clearing in the short-run. Prices are not changing quickly and flexibly, but

slowly. However, this alone can not change the nature of the model, it only generates a new problem, namely the logical contradiction of short-run disequilibrium price adjustments and long-run equilibrium adjustment.

However, in the non-mainstream area there was a significant shift in the critical analysis of static models. The criticism of the post-Keynesian school (Davidson [1982], Lavoie [2014]) that is closely related to Kornai's ideas is of great importance here. If the economy is not in the state of constant equilibrium or immediate equilibrium adjustment (without any need of time), then the economic processes are not ergodic<sup>1</sup> according to post-Keynesian criticism. In this case, however, most of the analytical tools of neoclassical/new classical economics (dynamic optimization, rational expectations, potential path of output, etc.) become unusable.

As a result of this finding, it is of decisive importance for neoclassical/new classical economics to consider the assumption of equilibrium as a paradigm. The equilibrium theory is not based on a priori empirical observations, but by mere supposition (as an assumption of the ideal-type of an analytical tool). In reality, economic equilibrium (its existence or non-existence) can not be directly observed, since economics does not have the tools to signal this, not even in theory. Economic equilibrium is broadly accepted by the definition of the equality of supply and demand, when economic actors do not want to change their position further. However, we can not observe neither demand nor supply, as they are purely intentions for a purchase and sale at a given time and place. And as latent variables, they are not directly observable and can not be quantified. It is not a coincidence that Kornai was therefore trying to replace and precise the concepts of supply and demand with the operational categories (aspiration level, Kornai [1971], chapters 12-19).

Paradoxically, while we are unable to observe the equilibrium, we can observe its absence much more so. Shortages, queuing, unsold inventories, high unemployment, low or even excessive utilization of capacities, all suggest that equilibrium has not materialized. However, the exact extent of disequilibrium can not be accurately determined from these data, because even those directly-occurring anomalies do not show the degree of fulfillment of the aspirations of all economic actors, as many do not declare these in observable ways. In addition, these disequilibrium indicators can not be summed up in a universal index (Kornai [1980]).

The assumption of equilibrium and equilibrium mechanisms can only be legitimized by the fact that economics based on this basic condition can be useful in practice. They help understand the peculiarities of the functioning of the economy and they aid economic actors to make good decisions. There are huge disputes between economists of traditional orthodox and new heterodox views in this regard. Káldor [1934], [1989] played a pivotal role in this debate. Orthodox accounts of the demand-supply mechanism and the benefits of rational-optimizing behavior could be listed on

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<sup>1</sup> A process is ergodic if its features observed in space and time (eg. mean, standard deviation) are constant in time. See more about ergodicity Bélyacz [2017].

the one hand and descriptions of market failures, economic crises and huge income differentials from the heterodox side. However, this lecture can not have the task of deciding this historic debate. It is merely invoked to make it clear that equilibrium and ergodicity are not purely theoretical but practical questions as well. If the majority of theoretical and practical economists will say in the near or far future that economic processes are non-ergodic, then they will also reject the equilibrium doctrine. After the rejection, a further question is what the content and nature of the new paradigm will be like and to what extent it will be based on today's heterodox theories (institutional, behavioral, evolutionary economics). This can not be predicted today.

And here is the exciting question whether it is possible to build economics on a non-equilibrium basis. Kaldor [1978] clearly stated that economics built on equilibrium basis struggles with serious problems that it can not solve within its own axiomatic system. The cornerstones he named, Smith-Young's theorem of increasing returns as well as the Keynesian theorem of effective demand, however did not prove sufficient to develop an alternative new theory. The same is true of attempts of the disequilibrium school (Benassy [1975], Clower [1965], Malinvaud [1976] and Quandt [1988]). The disequilibrium school attempted to develop a disequilibrium microeconomics for Keynesian disequilibrium macroeconomics, but it did not get broad acceptance. At the same time, however, the disequilibrium school enriched economic thinking with many interesting and important findings, even if it could not achieve a paradigm-worthy change.

Although a new economic paradigm system could not be built up with the rejection of the equilibrium assumption, Kornai managed to formulate a formal framework that provided a comparative analysis of the various non-equilibrium systems. In this context, macroeconomic disequilibrium is system-dependent, socialism: resource-constrained shortage economy, capitalism: demand-constrained surplus economy. Expressed by the terminology of Anti-equilibrium: suction and pressure as two types of persistent states in the economy. In the capitalist economy there is no (or rarely occurring) general equilibrium, it can be much more characterised by long-term unemployment, as Keynes (1965) has pointed out. The disequilibrium nature of the socialist economy was, in turn described by Kornai, in his book, *Economics of Shortage*. The description of the non-equilibrium operation of the two economic systems was attempted to be put a common foundation on the theoretical models of the disequilibrium school (see, for example, Keynesian unemployment and suppressed inflation disequilibrium models).

The other area where the post-Keynesian theory and the Kornai toolbox meets is Say's Law. According to Keynesians, Say's Law does not prevail in capitalism, supply does not produce its own demand (because the intentions of saving may be greater than investment intentions). By Kornai, this law is not fulfilled in socialism either, excess demand does not create its own excess supply. Because of the soft budget constraint on the socialist economy, demand can grow almost without any limitations (almost infinite demand). This latter finding on almost infinite demand has triggered

a serious professional debate in the Hungarian journal *Economic Review* (Soós [1985]). Clower-Leijonhufvud's article on the Say principle (Leijonhufvud, 1981) was a major step forward.

## Space-time, path-dependence, hysteresis

In *Anti-Equilibrium*, Kornai strongly criticized the assumption of the general equilibrium school on simultaneous behavior, that suggests that economic processes take place in a blink of an eye, in a concentrated, consistent manner. Káldor [1934] has already raised that equilibrium adjustment needs time, namely that the mechanisms needed to achieve equilibrium do not take place simultaneously. During equilibrium adjustment, things change, so the equilibrium state itself can change. An equilibrium of the starting position would only be available if there was a Walrasian auctioneer who would conduct market coordination with the sellers and buyers concentrated in space and time: it would collect the demand and supply at the declared price and would modify the current price until equilibrium is established. A Walrasian auctioneer would not be a necessary if market contracts could be repeatedly re-established (à la Edgeworth) so that only equilibrium transactions could be made. However, in the absence of these conditions, realistic account needs to be taken of the fact that there could be several different equilibria depending on the specific form in which the adjustment process takes place.

Expanding the problem indicated by Kornai and Kaldor to the general level raises the question of how mainstream economics has handled the space-time framework of analysis. In most mainstream economic studies, space and time do not appear at all or are narrowed down into a point of the imaginary coordinate system in which the economic processes are concentrated. Thus, the specific space and time have no role in shaping the processes. When the time necessarily turns up, because the economic events have to be sorted logically, mainstream economists use neither a specific historical nor calendar time, but instead a logical time to measure the duration. Hicks [1979] pointed out that the use of logical time was taken over to economics from experimental natural science, but in a mistaken way. While in the case of natural phenomena the subjects of inquiry do not have consciousness and free will, the subjects of the economic processes are people who are able to learn from their past experiences and to modify their behavior. Consequently, in natural sciences the observed phenomena can be reproduced without limitation (mass phenomena), regardless of the specific space and time, under given experimental conditions. The whole of human actions that form economic processes, are however always unique and therefore given in a specific historical time. Their investigation can only be relevant in the specific social context (Robinson [1980]).

The logical space and time concept is well-established in the explanation of the orthodox equilibrium mechanism of economics. The Marshall-like mechanism of de-

mand-supply-price assumes that (i) the price varies according to excess demand; (ii) demand and supply are in line with the size of the price (based on fixed demand and supply functions). This dual adjustment mechanism necessarily leads to the creation of an equilibrium price and situation. It is easy to see that this dual mechanism works only when the economic actors appear concentrated in space (eg. in an auction house) and if price adjustments take place in the blink of an eye, in a very short time (for example, using an auctioneer, as Kaldor [1934] pointed out). If more time is needed for adjustment then the mainstream logic says "time stops" (Kornai-Martos [1981] p. 21) all economic activity stops, except for price adjustment, otherwise the equilibrium state itself may change, and there would need to be a constant adjustment to different states. Precisely because of the avoidance of the variable equilibrium point, it is not even permissible that the excess demand that materialises during the process has an effect on production because it may change the nature of the supply function (Robinson 1978, p. 128).

The simplified static representation of the market is also shown in a schematic representation of competition. According to the neoclassical view, there are no real winners and losers here, because if there were, many would go bankrupt, while others would grow in size, so a precondition for perfect competition would not be warranted. Because of the static view, it is always the case that the continuous competition of firms of the same size brings the common good (Pareto optimal state) to the buyers. In reality, however, the competition selects, there will be winners and losers and the perfect competition condition almost never materialises (Weeks [2014]). There will be dominant positions and some must bear the burdens of adjustment. In constant change, the Walrasian equilibrium never happens. But competition as a dynamic process has a positive aspect, which Kornai has clearly seen, and with time is duly acknowledged. This is the necessity of technical and technological development. The constant renewal, technical innovations, which constantly change the range of products and production procedures. Schumpeter's creative destruction. It is a peculiarity of market economies, not socialism.

If we subscribe to the view that the use of historical (calendar) time rather than logical time is more appropriate in economics, then this will have further effects as well. On the one hand, it is the phenomenon of path-dependence and, on the other hand, the difficulty - not to say its impossibility - of establishing causal relations and economic laws. Path-dependency means that the present possibilities of the economy and its future decisions are substantially determined by the state of its past functioning (economic structure, capital, amount of labour, quality, inventories, social and environmental conditions, etc.) and the accumulated experience of economic actors. Some of the choices made earlier have closed certain possibilities (due to the restrictive, irreversible state of the fixed state) while others have been opened for that economy. New decisions are constantly changing the course of progress. There is therefore no equilibrium state or sustainable equilibrium path, as mainstream claims, but there are many possible paths out of which the actual is laid out following the choices of the

economic actors. And this is far from the equilibrium approach, which sets a single fixed path along which the economy necessarily needs to move and from which deviation is only possible by external shocks temporarily.

The sustainable growth path is a very fashionable analysing tool for today's mainstream economics, which essentially represents a time series of macroeconomic equilibria. According to the orthodox doctrine, market economies will only deviate from this path if they are hit by external economic shocks. The deviation, however, is only temporary, as the equilibrium mechanisms immediately come into effect and return the economy to the sustainable path. If this was the case, the economy could indeed be characterized by the equilibrium paradigm, as the sustainable equilibrium path can be defined and well predicted, provided, of course, that the external shocks are "well-behaved" (normally distributed with a given expected value and constant standard deviation). The only problem is that real economies never, anywhere, work this way.

To see why, let's assume that the economy is on the equilibrium path when an external shock hits it. How realistic is it to assume in this case that the shock will have no effect on the internal structure of demand and supply, on the expectations of economic actors, on inventories, etc.? It's not at all realistic. If, for example, a demand shock affects the economy, it seems quite obvious that this will have an impact on supply conditions, for example, the increase in production may reduce unit costs (increasing returns). The shock may also affect the labor market, and can change the level of unemployment. All of these changes mean a new equilibrium situation so the starting equilibrium path will no longer be valid, the market forces will no longer lead the economy to the old path, but to a new one. Of course, it will cause further complications to determine how the shift in the path can be determined and how resilient the new path will be to the next shocks arriving according to schedule.

The phenomenon just mentioned is, of course, not new; economics has long been aware, for example, that the temporary increase in unemployment due to negative shocks does not go disappearance completely after the shocks. High unemployment raises the natural rate of unemployment, as defined by hysteresis theory (Blanchard - Summers [1986]). Empirical facts have shown that, even when the economy was hit by the same magnitude of positive demand shocks in the following period, the unemployment rate did not return to its original value. Those who lose their jobs and are unable to find work within a few months are less likely to return to the world of work over time (Setterfield [2009]). The same effect can be seen in the evolution of willingness to invest. As a result of major negative shocks (for example, in the case of an economic crisis), investment intentions are significantly reduced, enterprises become very cautious. In this case, government increases in aggregate demand (even above the pre-crisis level), do not result in investments (Arestis-Sawyer [2009]). In order to restore trust, much more would be needed.

An important aspect of this is the linkage between path-dependence and the existence of multiple equilibria is the exit from underdevelopment. In many cases, a coun-

try locked in the vicious circle of underdevelopment may well be aided by a big external shock (see, for example, Rosenstein-Rodan's big push theory). For example, a significant increase in aggregate demand may result in modern sectors becoming more profitable compared to traditional sectors, as large-scale production decreases unit costs in the case of increasing returns to scale (Pierson [2000]). Thus, the traditional sector is increasingly excluded from production, and the economy will converge to a new, much higher equilibrium than before. The key question is whether a demand can reach the critical size that is needed to break through the underdevelopment threshold and thus open the way for a higher growth path.

## Rational behavior, non-price control

The three basic assumptions of new classical economists – (i) optimizing behaviour of economic actors, (ii) market-clearing prices, and (iii) rational expectations – mutually assume each other and without exception rely on the assumption of equilibrium. Optimizing behavior is required for creating the equilibrium, and the only (cf. theorem of unicity) equilibrium, since a solid equilibrium can only arise if all economic actors are in an optimal position, otherwise they would want to change their situation continuously (cf. the theorem of Pareto optimality of the competitive equilibrium). In addition, foresight is also necessary for optimization as the decisions of the economic actors relate to the nearer or to the distant future. This is assured by the assumption of rational expectations that eliminate future uncertainties. But rational expectations are only possible if we know a model describing the overall economy, from which we can gain unbiased estimates, as only these can form genuine rational expectations. However, the model for the operation of the whole economy can only be formulated if this operation is regularly repetitive. Such regular repetitive operations can however only be expected if economic actors are optimizing in line with rational expectations. And this ends the vicious circle of tautological proof of Modern Trinity: (i) Rational, Optimizing Behavior – (ii) Equilibrium – (iii) Rational Expectations.

Kornai, in his book *Anti-equilibrium*, raised quite firm reservations regarding rational behavior and the optimizing behavior condition. At about the same time, in the seventies of the last century, Herbert Simon appeared with his theory on bounded rationality. Behavioral economics has emerged on this track, with Kahneman and Tversky as well as Nobel laureate Richard Thaler.

In the general equilibrium criticism, Kornai put special emphasis on the assumptions of constant returns to scale and diminishing returns to a factor and its unrealistic, arbitrary nature. The assumption of diminishing returns was obviously necessary for the neoclassical theory, because without it it could devise neither the optimization behavior, nor the equilibrium. Even before Kornai, Sraffa [1926] and Young [1928], then Kaldor (1978) also criticized the assumption of diminishing returns. Questioning the condition was quite justified even then, and much more so nowadays, especially

in the age of globalization. The mainstream however does not want to change it, because it would have to recognize that the equilibrium is not constrained by production, but from the demand side. And with this comes then the partial utilization of capacities, unemployment and stock of inventories. These disequilibrium parameters are of great importance in the Kornai's characterization of economic systems. It is worth noting that not only negative emphasis but also recognition of their positive role, for example, according to Kornai reserve capacities and inventories, can facilitate a fast and flexible market adjustment.

Prices play a key role in optimizing behavior and in reaching the equilibrium. According to the neoclassical/new classical theory, prices have a dual role: on the one hand it carries information and, on the other, determines income conditions through its development. However, Kornai understands the information system much more widely, believing that other factors (inventory level, stock of orders, rate of capacity utilization, shortage, queuing etc.) are also carriers of information and thus play a role in economic actors' decisions. With his fellow scientists he developed a model family of non-price-based vegetative (non-optimizing) regulation (Kornai-Martos [1981]). Regulatory models based on the stock of inventories, change of inventories have gained recognition also in the mainstream theory. Similar to changes in the level of inventories, the change in the rate of capacity utilization also contains significant information. This also has an increasing role to play in calculating potential output nowadays.

Kornai's non-price control, regulation without price signals, can be related to Keynesian quantity control, with the difference that the former (by the author's intent) is more of a micro level, while the latter is macro level. Kornai and his fellow scientists considered non-price control to be a generally prevailing mode of operation, but neoclassical synthesis strictly defined the boundaries of quantity and price adjustment: as long as there is no full capacity utilization, quantity adjustment prevails, and only after that can the price adjustment be activated in the economy. This rigid separation was later modified in the new neoclassical synthesis. According to the non-flexible, slow price adjustment theory and the ever-popular Calvo pricing, economic actors (regardless of their level of capacity utilization) do not change their prices continuously (for example, due to the cost of price changes), but rather in a staggered way. But after a certain time they will certainly adjust prices to the changing circumstances. Thus, the new neoclassical synthesis came to the conclusion that there is no price adjustment in the short run, but in the long run there is. With this compromise, they could explain why there was temporary disequilibrium. This type of interpretation of non-price or limited price adjustments is, however, very far from the concept of Kornai's non-price vegetative regulation.

Another important obstacle to rational decisions and the feasibility of optimizing behavior is uncertainty. Kornai devotes a relatively large space to discussing this problem, criticizing the deterministic view of general equilibrium theory and the assumption of perfect foresight. Mainstream economics tried to solve the unrealistic

assumption of perfect foresight by replacing it with rational expectations. Defining rational expectations assumes a good model for the whole economy. Practically, this means that it's feasible to collect relevant information about the entire economy in a model or a center. Hayek [1945] had decisively stated decades ago that the information system of market operation can not be centralized, it is not possible to gather relevant information to a center. And that is why it is not possible to replace the market system with an intelligent (and benevolent) central planner. Consequently, the fulfillment of rational expectations can not be assumed realistically either.

Oscar Lange [1936] opposed Hayek's view and with the model of market socialism he intended to prove that market coordination and efficient allocation of resources could be achieved without private property and real market. Lange later considered the determination of the optimal allocation of resources based on the orderly configuration of high-performance computers. His concept presupposes the concentrated appearance of demand and supply both in space and time, just as the Walrasian auctioneer. This discussion can be linked to the two-level planning model of Kornai-Lipták (1965), which attempted to rationalize the central resource allocation. The introduction of the two levels was needed in the planning, because Kornai had clearly seen that information could not be collected in one center, resource-allocation decisions should be made through a multi-stage iteration between the center and the executive level. However, the two-level planning model remained a theoretical construction.

## Economic Laws and Social Embeddedness

Kornai in Chapter 2 of *Anti-Equilibrium* makes a clear distinction between logical-mathematical sciences and real sciences: while the former is characterised by theories derived from axioms in a logically flawless way, the latter explains phenomena on the basis of assumptions that don't contradict reality. Economics is not a logical-mathematical science, but a real science whose task is to explain reality, which does not require verification from itself. This formulation of Kornai clearly makes a substantial difference between natural sciences and social sciences, including economics.

A very important difference compared to natural sciences is that economics has only very limited opportunities for controlled experiments. In most cases, ensuring the uniformity of external conditions can not be guaranteed in repeated observation of phenomena. Even in the simplest market transactions, we can not guarantee that the same environmental factors will prevail. Economic phenomena are mostly not mass-phenomena, which are regularly repeated, so they scope for mathematical-statistical analysis is very limited. Strange as it may sound, but even mass transactions observed on the stock market are not a mass phenomenon, because transactions that are later in time are already influenced by the results of earlier transactions and therefore can not be considered as independent experiments. Participants in the pro-

cess learn from past events themselves and reflect on changing circumstances in their newer decisions. This reflexivity is the very essence of social sciences and in itself prevents the regular functioning and ergodicity of the economy. Reflexivity creates a gap between natural sciences and social sciences, and also shakes the foundations of economic theory (Soros [2000] p. 22).

Consequently, the economic relations and laws can only be very relative, at most it is possible to count on certain causal relations if the *ceteris paribus*, the unchanged conditions principle is met. However, in the vast majority of cases, unchanged circumstances do not materialize because the economy is a constantly operating, changing system. This is why the "if, ... then" type of reasoning has a great deal of space, as no theory can undoubtedly determine their erroneousess, because in the case of non-fulfillment it can always be invoked that external circumstances have changed: the "if" did not happen and thus consequently, the "then" prophecy could not have been realized.

The non-equilibrium nature of economic activity here is also decisive, because it is not possible to formulate general laws in the field of economics as in physics. There are a lot of so-called laws, for example. the law of supply and demand, the Okun law, the Engel law, the Grescham law, the Kaldor-Verdoon law, and so on. These, however, tend to form longer-term relationships, tendencies, directions of movement, and not exact, causal determinations. The tendency-related nature here means that there are some causal relationships and balance relationships (eg. fiscal and debt constraints), but these can be temporarily overridden by changing circumstances and therefore do not affect their effects immediately, but only over the longer run, and often in modified form. Previously effective constraints (eg. given debt, exchange rate levels, etc.) change to some extent in the majority of cases as operating conditions change. Modifications are not only due to changes in the external environment, but also because economic actors are learning from their previous experiences and reflecting on their decisions.

Another reason why economics can not set up general laws, as natural sciences, is because the economy is a dynamic system that is constantly moving. But this constant movement is very different from that experienced in natural sciences, as it can only be interpreted in a specific space-time coordinate system as mentioned above in space-time treatment. In the consecutive (calendar) moments of time of the economic system, the process produces processes that are much smaller or larger than before, and therefore are in different states. Thus, it is of particular importance at what exact calendar time we look at the economy, because it will always show a different picture (dominant, therefore, historical, economic historical character). For those natural sciences where verified experiments can be performed, time is important because processes take place over time, but this elapse of time is not a chronological, calendar-like, but logical one. In John Hicks's words: experimental natural science is static, while economics is dynamic (Hicks [1979] x.).

One of the most common ways of recognizing laws is to collect individual observations, then to make logical (cause-and-effect) connections and thus to formulate relationships. After that, it becomes possible to test the laws through controlled experiments. However, in the examination of economic processes, such controlled experiments can not be carried out because, depending on space and time, there are very different circumstances that may frustrate the comparison of the results obtained with what the laws state. Although it is possible to set up laboratory conditions (of course primarily in the field of microeconomics), but the conditions set up here will necessarily deviate from the circumstances in which we expect economic laws to prevail. The use of controlled experiments in economics is difficult to implement because people operate the economic processes and in the behavior of these people one can not separate the economic and social motives. If we organize a series of experiments somewhere, it will not be valid elsewhere because other people will be included in it, or there will be another social context in which the economic relationships work. Therefore, economics can not go beyond the boundaries of social sciences and it can not become an exact formalized science as the neoclassical and new classical economists of the general equilibrium school intend to do. Kornai has repeatedly pointed this out in *Anti-equilibrium* and his other works.

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