

Janos Kornai and General Equilibrium Theory

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Abstract : This paper explores the evolution of Kornai's thought on General Equilibrium Theory (GET) and his position on mainstream economics. Three moments in this evolution will be highlighted starting by rejecting GET and advocating disequilibrium in Anti-Equilibrium (1971). While Kornai does not treat the 'equilibrium paradigm' as irrelevant, he suggests an alternative paradigm, namely economic systems theory that he further develops in the eighties as 'system paradigm'. Economics of Shortage (1980) marks a second phase in which Kornai distinguishes Walrasian equilibrium from normal state or Marshallian equilibrium. In this phase, he supports Marshallian equilibrium rather than disequilibrium. Finally By Force of Thought (2006) is a critical self-appraisal in which Kornai considers Anti-Equilibrium as a 'failure' and acknowledges GET as a benchmark of an ideal competitive market. He now advocates a Walrasian equilibrium as an abstract reference model but refuses to consider this model as a description of reality. In this sense, he refuses the New Classical economics. Paradoxically however, his original heterodox concept of 'soft budget constraint', irreconcilable with standard microeconomics, has been integrated in new microeconomics as an optimal intertemporal strategy of a maximizing agent in the absence of credible commitments. It will be argued that Kornai's so-called failure is rather related to his half-in, half-out mainstream position, while his institutionalist system paradigm is still a heterodox research project of the future.

Keywords: Disequilibrium, Economic Systems Theory, General Equilibrium Theory, Marshallian and Walrasian Equilibrium, New Microeconomics, Normal State, System Paradigm

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Anti-Equilibrium is not merely an item on my list of publications. It was the most ambitious enterprise of my career as a researcher. I had undertaken something bigger and more difficult than what I was able to accomplish. I am aware of that, but it still does not make its failures easy to come to terms with. (Kornai, 2006, p. 197)

Introduction

Janos Kornai has largely contributed to the introduction of general equilibrium theory (GET) in Hungary and the Eastern bloc in general. While his book, *Anti-Equilibrium* (1971a), provided a detailed critical review of GET, it also presented the main idea, method, and assumptions of the theory to a whole generation of Marxist and non-Marxist economists in the Soviet bloc. As a fervent advocate of mathematical school, Kornai admired the mathematical rigor of Arrow, Debreu, Hahn, Hurwicz, Mackenzie and other GET theorists and welcomed this line of work as part of a new field of research in economics, that he coined *economic systems theory* (Kornai, 1971a, p. 1-2). However, he questioned the validity of GET as a “real-science” theory and argued that it was only an “intellectual experiment” (Ibid, pp. 11-12) that needed a “revolution” to come to terms with a scientific explanation of economic realities. “A synthesis of the careful attempts to improve the equilibrium theory may turn the “reform” into a “revolution”, into discarding and transcending the orthodox theory.” (Ibid, p. 367).

Kornai’s position on GET in the early seventies radically changed throughout time. After the initial rejection (*Anti-Equilibrium*), he gradually came to revise and accept the main message of the theory. He first accepted GET as a benchmark for an efficient perfect competitive market in the late seventies and during the eighties. *The Economics of Shortage* (1980) represents this first revision. Summing up his reflections on this major project of his life in 2006, he revised his position for a second time and acknowledged his error in calling for a “revolution” and accepted Hahn’s (1973) criticism of *Anti-Equilibrium* with regard to the philosophy of science as well as the possibility to improve the theory through successive “reforms”. Kornai regretted his critical standpoint in many respects and while considered worth publishing *Anti-Equilibrium*, he deemed the whole adventure was a “failure” (Kornai, 2006, p. 197).

Interestingly enough, despite his long ‘adventurous’ journey in exploring GET, he incessantly regarded this theory as part of *economic systems theory* and not as the core of “pure political economy”² (Walras, 1874/1965) or standard *microeconomics*. This leads us to raise a fundamental question about Kornai’s initial project: was it about the shortcomings of GET or the promotion of an alternative *theory of economic systems* that he later named ‘system paradigm’ (Kornai, 2016)?

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² *Elements of Pure Economics*, the title of Leon Walras’s lectures published in 1874 (1965).

And how should the ‘failure’ be assessed: was it a failure of *Anti-Equilibrium* or a failure of systems theory?

In reviewing Kornai’s position on GET, we will first study the intellectual background of the early seventies (section 1), and then successively discuss three moments in the evolution of his thought concerning equilibrium, namely *Anti-Equilibrium* (1971) (section 2), *Economics of Shortage* (1980) (section 3), and *By Force of Thought* (2006) (section 4). Section 5 will explore Kornai’s position on new microeconomics with regard to equilibrium. We will finally conclude by examining the causes of Kornai’s so-called ‘failure’.

1. The introduction of GET in the Eastern bloc

The center of economic thought has transferred from the British Cambridge to the American Cambridge after the Second World War. The Cambridge Capital theory controversies (Cohen and Harcourt, 2003) in the sixties between Samuelson and Solow at the MIT on the one hand, and Joan Robinson and Piero Sraffa at the University of Cambridge on the other hand, mark this important turning point. The mathematical school dominated economic discipline despite the serious unanswered challenges by the post-Keynesian school regarding the notion of capital, and the reswitching issue. The formulation of GET accentuated the tension between post-Keynesians and the proponents of the Walrasian general equilibrium or the so-called ‘Neoclassical’ school. This confrontation was already intense at the University of Cambridge between two contending groups, one led by Joan Robinson and Nicholas Kaldor and the other by Frank Hahn in the early seventies.

Kaldor’s lecture on “The Irrelevance of Equilibrium Economics” claims unequivocally that “the powerful attraction of the habits of thought engendered by "equilibrium economics" has become a major obstacle to the development of economics as a science- meaning by the term "science" a body of theorems based on assumptions that are empirically derived (from observations) and which embody hypotheses that are capable of verification both in regard to the assumptions and the predictions.” (1972, p. 1237). Kaldor reiterates Kornai’s distinction between an “intellectual experiment” and a “real-science theory” (Ibid, p. 1238) and describes GET as one of “continual *degress*, not *progress*” from the former to the latter.

What was Kornai’s position in this controversy? More recently, Kornai described his position in the following terms: “Nowadays, I like to characterize myself as having one foot in and one foot out of the mainstream.” (Kornai, 2006, p. 195). Although *Anti-Equilibrium* is rather a direct challenge to mainstream economics, Kornai is not wrong to say that even in this work he had one foot in the mainstream: “I consider myself a mathematical economist; thus my critical remarks come not from “outside” but from “inside” the circle. These remarks, therefore, may be regarded in many cases as self-criticism as well as criticism. It is my conviction that the further progress of economic theory will depend, if not exclusively at least significantly, on the advances made in the field of mathematical economics. It is in this area that I hope my work can make a contribution.” (Kornai, 1971a, p. 4). This message has not been unnoticed to Hahn when he was reviewing Kornai’s book: “I have found it hard to understand what it is that Kornai wants to be done. For he is not against formal reasoning; indeed he laments the lack of new Von Neumanns.” (Hahn, 1973, p. 330).

According to Kornai, his relationship with both contending groups at the University of Cambridge was a major reason for Richard Stone offering him a position at that university: “There was tension mounting there between two groups, one of mathematical economists, headed intellectually by Frank Hahn, and the other opponents of such methods, centering around Joan Robinson and my fellow countryman Nicholas (later Lord) Kaldor. His probings of opinion so far suggested to him that both sides would be pleased to see me given a chair, a development that might even help to ease the tension. He offered the professorship not on his own initiative, but on behalf of his colleagues.” (Kornai, 2006, p. 219). While Kornai declined the offer, he tried to entertain a regular, interactive intellectual contact between the Eastern and the Western economists, particularly with mainstream economics. Maintaining his Hungarian Academy of Sciences affiliation and coming from a socialist system gave solid credentials to Kornai to be heard by economists all over the socialist camp³.

At the time, the post-Keynesian economists were known to the soviet economists. They were not regarded as ‘bourgeois economists’ but Paul Samuelson and other neoclassical economists were often labelled as such. “Up to the present, the GE [general equilibrium] theory has been criticized mainly by Marxist economists engaged in the history of theory and in the critique of bourgeois economics, and not by those whose interest is concentrated on the socialist economy and on the constructive development of economic systems theory.” (Kornai, 1971b, p. 316). Kornai pleaded for a change of attitude towards the neoclassical economics and neoclassical economists. He emphatically insisted on the *political and ideological indifference* of GET: “in my opinion, the GE theory is politically indifferent and sterile. Its strictly axiomatic form does not contain any unequivocal political interpretation. The theory's axioms and basic assumptions may be good or bad - but they are politically indifferent...the GE theory admits of a *variety of political interpretations*. It may constitute the ideology of a strictly centralized special “market socialism” (O. Lange). Models closely related to the GE theory may serve to justify the hypothesis of a strictly centralized socialist economy planned by computers, as described by some Soviet authors. But the same model may, according to another interpretation, serve as the ideology of a completely decentralized and liberal capitalist “free-market” economy (see e.g. Ropke’s works). The GE theory must not necessarily be termed anti-socialist, notwithstanding the role played by anti-socialist concepts in its coming into being and development. From the purely *political* point of view, its axioms and ways of posing questions could be acceptable both to Marxists and non-Marxists.” (Kornai, 1971b, p. 315). During the Cold War, Kornai was not the only scholar who sought for a ‘common language’ between capitalist and socialist currents. Before Kornai, Claude Lévi-Strauss (1954, p. 650) regarded ‘game theory’ as that ‘common language’: “This new economics simultaneously contributes to two grand currents of thought that have shared economic science until now. On the one hand, pure economics that identifies *homo æconomicus* as a perfectly rational individual; on the other hand, the sociological and historical economics that has been founded by Karl Marx and which is principally devoted to the dialectics of combat. Yet the two

³ Kornai’s influence in the Chinese economic reform since the Bashan Conference (September 16-23, 1985) was partially related to this point which is stressed by Kornai and his wife Zsuzsa Daniel themselves after their trip to China in 1986: “We think that French or American authors, lacking personal experience, can hardly understand and interpret the Chinese events of the last decade...With Hungarians, empathy comes much more naturally.” (1986, p. 302).

aspects are both present in the theory of von Neuman. Consequently, for the first time, a common language is provided for bourgeois or capitalist economics, as well as Marxist one.” GET and game theory were both used by Marxist and liberal economists.

The political and ideological sterility thesis was a strong argument for entertaining a regular collegial relationship with the Western neoclassical economists. It should be reminded that the same argument saved the soviet mathematical school. Novozhilov, Kantorovitch and other proponents of the soviet marginalist school could continue their research thanks to this political sterility thesis. Kornai himself scrupulously clung to this thesis and systematically detoured economic topics with strong political implications in all his works before the post-socialist transition. For example, in the preface to *The Economics of Shortage* (1980, p. 13), Kornai explicitly excluded a discussion of the political system and ideological principles of communist regimes, as well as their international relationships within the COMECON bloc. However, he did tackle these questions after the collapse of the Soviet system (Kornai, 1992). He applied the same method in conducting common research programs with neoclassical economists.

In addition to the political sterility thesis, Kornai maintained that the knowledge about GET had a universal *cultural* value: “No economist can be called educated and well-versed in his own branch of science who does not know thoroughly the general equilibrium theory and does not make it clear to himself, what his own relation is to this theory.” (Kornai, 1979a, p. 196). This ‘cultural’ aspect could have a strong echo in a time when Soviets were accusing the Chinese “Cultural Revolution” as a campaign against all universal cultural values. Finally, in promoting GET, Kornai also extolled certain personal qualities of its architects: “Although he [Arrow] is not in the frontline of political fights, he does not keep away from public affairs. He was among those who protested against US intervention in Vietnam, and against racial discrimination.” (Kornai, 1979a, p. 201).

Undoubtedly, GET could not be introduced in Hungary or any other socialist economy without being severely criticized. But Kornai did not wish to close the door to GET and end up the discussion by labelling it as ‘bourgeois ideology’: “It is not for political reasons that the GE theory should be rejected but because it cannot be properly used. It constitutes *an economic systems theory that is not workable*.” (Kornai, 1971b, p. 316). His book was a prolegomenon for the revolt against GET, but as Kovacs (1991, p. 51) aptly remarked: “Ironically, since the publication of his *Anti-Equilibrium* in 1971, whole generations of Hungarian economists have been introduced to the general equilibrium model through its critique. Kornai’s polemical work had a paradoxical impact on the evolution of reform economics. Strangely enough, this was the first book in the history of Hungarian postwar political economy whose author wanted, based on an extensive knowledge of economics in the West, to open a dialogue with the adherents of the latter. Unfortunately, however, he could not manage to pierce the “splendid isolation’ of reform economics.” Clearly speaking, Kornai rendered a significant service to mainstream economics: it was through his work that Hungarian economists became familiarized with GET.

2. *Anti-Equilibrium*: system paradigm versus equilibrium paradigm

To periodize different phases of Kornai’s standpoint on GET, I will associate each period to one of his major works without excluding his other works. Kornai’s initial position on the subject is

presented in *Anti-Equilibrium*. There are surely other papers during the period 1971-1979 that reflect this first phase of Kornai's position (see for example, Kornai, 1971b, c, 1972).

In the economic literature, GET is always considered as the core of standard *microeconomics*. Léon Walras introduced his GET in the *Elements of Pure Economics* ([1874]1965) devoted to *price theory* under a “hypothetical state of absolute competition” (*concurrence absolue*). Arrow, Debreu and the advocates of the neoclassical synthesis interpreted GET as *microeconomics* and the Hicks IS/LM model as *macroeconomics* or the *income theory*. Kornai's taxonomy is somehow completely different. He does not classify GET as a branch of micro or macroeconomics but as part of a new branch that he coins ‘economic systems theory’. “Economic systems theory is but *one* branch, one domain of economics and does not embrace economic science in its entirety. Another branch of economics is *macroeconomics* (...), it treats the economy *as a whole*. A further branch is *microeconomics* which analyses (...) some *part* of the economy. Economic systems theory is, however, separate from both, wishing to deal, as has been pointed out above, with the *relationship between the whole and the part*.” (Kornai, 1971b, p. 302).

But what is economic systems theory about? Kornai cites Leontief's inter-branch input-output model as an illustration. While this model captures the material structure of the economy or the production-technical relations between production and consumption, the focus of economic systems theory should be on the way the *control* of material processes is taking place, what information serves this purpose, what are the characteristics of the decision processes of economic organizations, and in sum how the decision-information-motivation structure functions⁴. The Leontief model describes the “body” of the economy, whereas the economic systems theory is centered on the “soul”, “brain” and the “nervous system”. Kornai's *biological* depiction of economic activity emphasizes the organic nature of the system⁵. But what is the “soul”, “brain” and the “nervous system” of the economy?

According to Kornai, this includes first of all, the “organizations and institutions [that] are functioning within the system beside the basic units of production and consumption, i.e. the firm and the household.” (Ibid, p. 302-3). *Institutions* and *organizations* are the ‘soul’ of the economic systems. The next is the Decision-Information-Motivation structure which is the equivalent of the “brain” (decision-making center), and finally coordination mechanisms (market, bureaucratic, etc.) provide the “nervous system”. In Kornai's viewpoint, while a vast literature has been published in *micro* and *macroeconomics*, “in economic systems theory, only very few major works have been published so far...The GE [General Equilibrium] theory can be rightfully classified as belonging to the domain of economic systems theory.” (Kornai, 1971b, pp. 303-4). This statement is somehow awkward, not only because the inceptors of GET consider it as the core of *microeconomics* but also because this model does not satisfy most of Kornai's criteria.

In fact, how can an *axiomatic* representation of economy include *institutions and organizations*? The firm is nothing but a black box in GET and the institutions are reduced to two *fictional* entities:

⁴ Comparing economic systems, Duffy and Neuberger (1976) describe the economic processes in terms of Decision-Information-Motivation (DIM) structure.

⁵ It is not the only place where Kornai compares economy with biology. Kornai (1983c) explores the similarities between the medical sciences and economics.

1) Walras's *crieur des prix* that replaces all relationships among decentralized agents; 2) the *Compensation Chamber* replacing money. As Kornai (1984, 1992) correctly noted, there is no "coordination" mechanism in GET; there is only an "allocation" mechanism since the model is exempt of all institutions and organizations coordinating decentralized agents. The 'economic systems theory' in the case of GET is thus reduced to the possibility of the emergence of an *order* or an 'equilibrium'. But Kornai argues that while the axiomatic reasoning is valid as an "intellectual experiment", it is not a "real-science theory" because of four fundamental assumptions of the model that are in conflict with the reality: 1) The *stationary* character of the model that precludes change; 2) *Optimality* or maximizing assumption for describing the behavior of firms and consumers that reduces the complexity of their behaviors; 3) The *convexity* assumption that excludes the economies of scale; and finally 4) *uncertainty* and diversity of quantity versus price signals that are not captured in the model (Kornai, 1971a, pp. 19-23; 1971b, pp. 307-313).

The critique of 'optimality' is also stressed by Herbert Simon (1979, p. 508) in his Nobel laureate speech in which Kornai is cited for showing the dichotomy between "supply-driven and demand-driven management". The refusal of 'convexity' assumption is particularly supported by Kaldor's (1972) major paper on the irrelevance of equilibrium. In his Nobel laureate speech, Arrow refers to the issue of *non-price signals* in both Leijonhufvud (1968, especially chapter 2) and Kornai (1971a), but he then adds: "Nevertheless, while the criticisms are, in my judgment, not without some validity, they have not given rise to a genuine alternative model of detailed resource allocation." (1974, p. 254).

In fact, the conceptors of GET have never denied that their assumptions were often unverifiable or contradictory with realities. They regard this 'unrealism' as part of axiomatic or formal modeling, and acknowledge that "The issue is not at all whether Kornai is correct when he points at important problems: it is how they should be tackled" (Hahn, 1973, p. 329). Illustrating his point, Hahn underlines the treatment of sequence economies, as well as stochastic equilibria in the later works of General Equilibrium theorists by relaxing some of the initial axioms of the model while retaining others. He then asks: "why does Kornai object to a sequence of "reforms" which a good many people are now engaged in and why does he think it a good strategy to introduce them all simultaneously?" (Ibid, p. 328). Kornai calls for a revolution, since he assumes that the introduction of realist assumptions will lead to *disequilibrium* rather than equilibrium. Kornai acknowledges two possible interpretations of GET, one 'normative', the other 'descriptive'. However, he thinks that both interpretations are unjustified: according to Kornai, GET is neither a valid 'normative' model nor a 'descriptive one'. "What is needed is a *criticism* of both interpretations which cannot be separated from each other. The descriptive interpretation is the primary one. (...) No normative theory can be taken seriously which cannot be carried into practice." (Kornai, 1971b, p. 305).

From a *normative* viewpoint "disequilibrium is preferable to equilibrium" (Kornai, 1971b, p. 314) and from a *descriptive* viewpoint, the typical state is not equilibrium but constant deviation from the latter, namely excess supply (surplus) or excess demand (shortage). The former is named

‘pressure’, the latter ‘suction’⁶. The third part of *Anti-Equilibrium* as well as Kornai (1971c, 1982) are devoted to the investigation of these two types of *constant deviations from equilibrium*. Suction is linked to a “shortage” economy in which sellers are dominant over buyers. In contrast to suction, pressure is associated with a “surplus” economy where buyers dominate sellers on the market. According to Kornai (1971c, p. 35), “while equilibrium is more favorable than suction, slight pressure is more advantageous than equilibrium.” Generally speaking, ‘pressure’ is preferable to ‘suction’, since more progress takes place in a pressure than in a suction economy (Ibid, p. 15). But what is the cause of ‘suction’ or ‘pressure’? Are they engendered by specific property relationships or institutional structures such as socialism or capitalism?

Kornai’s (1971a, b, c, 1972) answer to this question is negative. “Suction conditions can exist in both socialist and nonsocialist countries. Suction often accompanies war in capitalist economies. It has also appeared in several nonsocialist developing Asian and African countries. This indicates that suction is not exclusive to socialist ownership relations, but rather arises due to certain economic situations or policies.” (Kornai, 1971c, p. 18). In Kornai’s opinion, Hungary in the aftermath of the New Economic Mechanism (January 1st, 1968) started the transition from a ‘suction’ (shortage) to a ‘pressure’ (surplus) economy. This transition was notably successful in the food industry, light industry, and certain parts of the engineering related to consumption branches as well as export industries. By contrast, in building industry strong suction persisted. Kornai revised this position by the end of the seventies and clearly advocated an institutionalist approach in *The Economics of Shortage* (1980)⁷.

To sum up Kornai’s critical assessment of GET in the early seventies, it can be said that he opposed ‘disequilibrium’ to ‘equilibrium’. If economic systems theory should have completed Leontief’s model by studying the “soul”, the “brain”, and the “nervous” system of the economy, then how could ‘disequilibrium’ provide a better understanding of *economic systems theory*? It seems to me that instead of opposing a more comprehensive systems theory to GET, Kornai took another path, a path which was determined by GET. This path was an investigation of ‘disequilibrium’. Contrarily to Kaldor, Kornai did not consider ‘equilibrium’ as irrelevant. He gave the pride of place to this concept by searching its ‘negation’ or disequilibrium. Other issues related to the economic systems theory, namely ‘system paradigm’ were neglected. *The Socialist System* (1992) provides a theoretical framework comprising the “soul”, the “brain” and the “nervous” system of the economy. Interpreting the *change* of system, Kornai (1992) started to clarify what a “great” system means. He summed up three major characteristics of any economic system: 1) political structure and related dominant political ideology; 2) property relationships; 3) coordination mechanisms (the relative weight of market, bureaucratic, ethical or other types of coordination

⁶ ‘Pressure’ and ‘suction’ are Kornai’s terminological innovation. Hahn (1973, p. 328) harshly criticized this type of innovation and preferred the use of ‘excess supply’ for ‘pressure’ and ‘excess demand’ for ‘suction’. Kornai (1971c, p. 34) was against this conflation: “Although they are obviously related, the two concept pairs “pressure-suction” and “excess supply-excess demand” are not synonymous.” Kornai (1980, pp. 89-90) acknowledged the failure of his terminological innovations, and he (2006, p. 189) conceded that “I have to say that the two names were not accepted by economists or in general speech and I abandoned them in later writings, turning to the expressions “buyers’ market” and “sellers’ market,” which had earlier become current among economists.”

⁷ For a detailed investigation about this change of position in Kornai from ‘economic policy’ to ‘institutional’ factors particularly ‘behavioral regularities’, see Vahabi, 1993.

mechanisms). These three principal constituents of an economic system depict the hierarchy of the causal chain: the first bloc determines the second, and that in turn conditions the third (Kornai, 1992, pp. 360-65). In his recent paper on ‘system paradigm’, Kornai (2016, p. 549) acknowledges that what he calls a ‘great system’ is related to the neo-Marxist concept of “social formation”.

Wrong or Right, this is another line of reasoning than that of GET, since it is about the relationship between the parts and the whole of an economic system and *not only microeconomics*; it embraces institutional structures and coordination (and not allocation) mechanism⁸. This systems theory brings back politics into economics and searches for the ‘political economy’ of communism or any other system. And last but not least, its multi-disciplinary character allows us to study the issue of system *change*. This line of reasoning is also different from the one followed by Kornai in opposing GET in 1971, since while it emphatically looks into the emergence, persistence and demise of an ‘order’, it is not imprisoned by disequilibrium versus equilibrium. *Political sterility* was an ally for introducing GET as well as for proposing partial economic reforms in the ex-socialist systems, but it was of no avail for the task of founding an alternative road to economic systems theory. How could the critical position of Kornai then be characterized in *Anti-Equilibrium*?

I would say that it was anti-neoclassical. But what do I mean by ‘neoclassical’ school? I adopt Hahn’s (1984, pp. 1-2) definition of this term⁹: “I have frequently, and especially in my university, been classified as a neoclassical economist... There are three elements in my thinking which may justify it: (1) I am a reductionist in that I attempt to locate explanations in the actions of individual agents. (2) In theorising about the agent I look for some axioms of rationality. (3) I hold that some notion of equilibrium is required and that the study of equilibrium states is useful”. Returning back to Kornai (1971), all three elements are denied.

First, as a fervent advocate of economic systems theory, Kornai does not support ‘reductionism’ or ‘methodological individualism’. In fact, he does not even acknowledge GET as a branch of microeconomics.

Second, Kornai is against the ‘rationality’ and ‘optimality’ assumptions. He explicitly rejects the idea that individual consumers define their choices in accordance with the ‘transitivity’ criterion: “As for me, I doubt if *individual* behavior is “rational” in the neoclassical interpretation of the word. In the series of individual actions inconsistency, and a frequent violation of the transitivity principle and of some other postulates of “rational behavior” are observable. *Social* decisions seem to be even less consistent. It often happens that a decision-making body today prefers A to B, tomorrow B to C, and after-tomorrow C to A. In observing the series of consecutive and

⁸ *Allocation* mechanism is about the way scarce resources are allocated. Its focus is on the relationship between human and resources rather than the relationship between humans (among individuals and organizations). The latter is captured by *coordination* mechanism.

⁹ Although Hahn’s definition of the term is particularly relevant in this context to classify Kornai’s position with regard to GET, it is perhaps not the most accurate definition. Among others, Gary Becker (1976, p. 5) captures the underpinning tenets of neoclassical approach as practiced today when he describes it as “the combined assumptions of maximizing behavior, market equilibrium, and stable preferences, used relentlessly and unflinchingly.” However, the maximizing behavior is not used “relentlessly and unflinchingly” in Walras (see Jaffe, 1954, p. 165). In this sense, Walras cannot be classified a neoclassical in Becker sense.

comparable decisions we can see *vacillation* - in a better case experimentation, and in a worse one simply inconsistency.” (Kornai, 1979a, p. 200).

Third, in *Anti-Equilibrium*, Kornai does not consider that the study of equilibrium is useful. Indeed, he strongly argues that the notion of disequilibrium is much more useful.

Following Hahn’s definition of neoclassical school, Kornai was a ‘heterodox’ but a heterodox that was fascinated by ‘orthodoxy’, particularly by its formal reasoning, and its equilibrium paradigm. The major tension of Kornai’s thought in the early seventies was between ‘system paradigm’ and ‘equilibrium paradigm’. While *Anti-Equilibrium* was formally against all three principles of the so-called neoclassical school, its research program was largely determined by the equilibrium paradigm.

3. *Economics of Shortage*: from disequilibrium to Marshallian equilibrium

Contrarily to *Anti-Equilibrium* which was subtitled “On economic systems theory”, *Economics of Shortage* (1980) was not about economic systems theory but about a specific state of disequilibrium, namely “shortage” or *suction*. The book was principally presented in the field of *microeconomics* and to a lesser extent in the domain of *macroeconomics*. But there is no allusion to a third branch of ‘economic systems theory’. “The book approaches several questions from the *macroeconomic* viewpoint... Yet the larger part of the book is of *microeconomic* character. Its main task is to clarify the micro-foundations of macro-processes.” (Kornai, 1980, p. 14).

More importantly, while in *Anti-Equilibrium*, ‘shortage’ and ‘surplus’ were characterized as two states of *disequilibrium*, in *Economics of Shortage*, both states were regarded as two states of *equilibrium*. This new way of characterization was related to a distinction between a broad and a narrow sense of equilibrium. The narrow sense of the term was limited to *Walrasian* equilibrium and the broader was defined as “that state of a system to which it always returns on account of its own regularities.” (Kornai, 1980, p. 144). In this sense, shortage and surplus were viewed as non-Walrasian equilibria or the ‘normal state’ of different economic systems. The term ‘normal path’ of a system was interpreted as a tendency towards a stable equilibrium (Kornai, 1983a, pp. 149, 152, 156). As substantiated elsewhere (Vahabi, 1998), *normal state* is a *Marshallian* concept of equilibrium that does not exclude market disequilibrium of low intensity. Instead of ‘disequilibrium’, Kornai was now reinterpreting any constant deviation from Walrasian equilibrium as Marshallian equilibrium. This reinterpretation of *disequilibrium* as a form of *Marshallian* equilibrium was in line with various trends of disequilibrium school advocated by many economists in the seventies and the eighties including Clower, Leijonhufvud, Barro, Grossman, Malinvaud, Grandmont, Benassy, Drèze, Laffont, Laroque, Portes, Younès and many others (see Vahabi, 1993, 2001; De Vroey, 2009; Andreff, 2016). All these trends were inspired by (neo-)Keynesian and the neoclassical synthesis trying to construct a general equilibrium model based on the interdependence of different markets in partial equilibrium.

In light of this new turn in Kornai’s adherence to equilibrium paradigm, *Economics of Shortage* provided a self-criticism: “I must acknowledge that my book, *Anti-Equilibrium*, was itself insufficiently precise in its interpretation of the word “equilibrium”... I referred to pressure and suction as states of permanent *disequilibrium*, which suggest that the “genuine” equilibrium is the

Walrasian one. Now..., I consider pressure as well as suction to be normal states of an economy, under suitable conditions.” (Kornai, 1980, p. 147). But once non-Walrasian equilibrium is acknowledged, GET cannot be rejected as a benchmark for competitive markets.

Indeed, Kornai revised his position in *Economics of Shortage* and conceded that GET must be admitted as a *normative model* or an abstract frame of reference: “Reality is never so “perfect”. Yet this pure theoretical structure, owing exactly to its “perfection”, seems to be suitable to serve as an *abstract frame of reference*. The Walrasian system and its specific form: the Walrasian market equilibrium may play a role similar to that of the absolute zero point in physics. Every real physical body has a temperature higher than the absolute zero which cannot be reached by any real cooling. This absolute zero - existing only abstractly but well defined theoretically - may serve as an adequate starting-point of a measurement scale (...) We can elucidate the essential features of an economic system by observing and measuring to what extent it deviates from Walrasian point of reference.” (Kornai, 1979a, pp. 196-97).

The acceptance of GET as a benchmark of economic efficiency in a competitive market is so important in Kornai (1980), that he distinguishes a socialist system from a capitalist economy with regard to the validity or invalidity of Walras’s law¹⁰. At a *microeconomic* level, Kornai describes the behavior of an enterprise in a perfect competitive market economy to be completely sensitive to price fluctuations since the entrepreneur is subject to *hard budget constraint* (HBC)¹¹, i.e. his expected expenditures cannot exceed its expected revenues; otherwise the enterprise will go bankrupt. Hard budget constraint in Kornai is synonymous with what Clower (1965) calls ‘Say’s Principle’. Kornai (1979b, 1980) initially forged the concept of *soft budget constraint* (SBC) to capture the behavior of a socialist enterprise that may survive even in case of persistent losses thanks to the financial aid of a paternalistic state. Under such circumstances, the firm becomes non-responsive to price fluctuations. The concept does not refer to a single bail-out, but a recurrent practice of rescuing insolvent firms. Then, managers would expect a rescue if losses are made, and their expectations would shape their behavior. According to Kornai, the SBC is a source of both *real* and *nominal* (or *monetary*) inefficiencies. The first type of inefficiency (*real* inefficiency) is related to the fact that the presence of *ex post* bailouts increases the firm’s demand for inputs beyond the standard perfectly competitive level and is partially responsible for generating the chronic shortage characteristic of the socialist system. The second type of inefficiency (*nominal* inefficiency) or the loss in terms of actual distorted prices is related to the fact that firms under the classical socialist system have a weak price responsiveness. The SBC reflects the passive role of money in socialist sectors.

Both types of inefficiencies were prevalent in socialist economies because state enterprises were not restrained by their budget constraint or ‘Say’s Principle’. However, households were subject to the HBC (Kornai, 1980, p. 514) since they could not expect to cover their planned expenditures by anything except their expected revenues. The socialist state had a budget constraint which was

¹⁰ See footnote 12 for Walras’s law and Say’s Principle.

¹¹ Standard microeconomics does not distinguish soft from hard budget constraint. Budget constraint is by definition hard, since the amount of (expected) expenditures cannot exceed (expected) total revenue. For a short history of budget constraint, see footnote 10.

neither completely hard, nor completely soft. It was not hard, since the state budget had to cover losses of socialist enterprises. It was not always soft, since current expenditures of state agencies were usually subject to HBC (Kornai, 1980, pp. 528-29). Generally speaking, “In the capitalist system the firm has a hard budget constraint...in a socialist economy in contrast the firm’s budget constraint is soft...It follows from this that in the former system Walras’s law prevails. In the latter system, however, Walras’s law is not effective, at least within the firm sector.” (Kornai, 1980, p. 558).

In *Economics of Shortage*, GET provides a benchmark for measuring the real and nominal inefficiencies of socialist economies in which Walras’s law is not effective. As I have argued in several papers (see for example, Vahabi, 2001, 2005, 2014), this type of comparative studies of economic systems has two major shortcomings.

First, Kornai claims that in a perfect competitive market economy, Walras’ Law holds since budget constraint (Say’s Principle) is valid. However, as Clower and Leijonhufvud (1981) demonstrate, the validity of Say’s Principle does not exclude unemployment and thus does not automatically imply the validity of Walras’ Law even in a competitive market economy. Although Kornai concedes the distinction made by Clower (1965) between Say’s Principle and Walras’ Law in case of a socialist economy, he blurs this distinction with regard to a competitive market economy. In my opinion, the demarcation line between a competitive and a socialist economy cannot be made by referring to the validity of Walras’ Law in the former and its non-validity in the latter (Vahabi, 2001).

Second, two contradictory lines of comparative analysis may be distinguished in Kornai’s arguments. A first line of comparative analysis consists of comparing *real* socialist economies marked by soft budget constraints (SBC) with an *ideal* pure competitive economy as a reference point of hard budget constraint (HBC). By contrast, a second line of study advocates a comparison of *real* socialist economies (shortage economies) with *real* capitalist economies (underemployment economies). In *Anti-Equilibrium*, the comparison was between ‘shortage’ and ‘surplus’ economies, while in *Economics of Shortage*, ‘shortage’ economy is compared with an *ideal* competitive market. A comparison of these two works shows that several elements of mainstream economics have been integrated in Kornai’s theoretical framework by the end of the seventies. Kornai prolonged his orientation towards equilibrium paradigm. Instead of economic systems theory, Kornai was now advocating a *microeconomic* orientation to develop a *Marshallian* equilibrium theory of shortages in the market.

However, he introduced an original heterodox idea in the field of *microeconomics*, namely the soft budget constraint. The concept of budget constraint is one of the fundamental concepts of standard microeconomics¹² concerning the household’s (and not the firm’s) behavior. Disregarding the

¹² Walras intimated the “rationality” version of the budget constraint. He imposed a restriction of “zero value of (planned) trade” for the individual trader, but this was quid pro quo (Say’s Principle), not income constrained utility maximization (see Jaffe, 1954, p. 165). According to Jaffé, Walras considered his equations of exchange which were “budget constraints” as part of the requirements for justice in exchange. This interpretation has been contested by Walker (1996, p. 47-48) who denied any normative implication for budget constraints in Walras. While the budget constraint is implicitly present in Walras, as Costa (1998, p. 137) rightly argues the concept of budget constraint cannot be found in Walras. Allegedly Vilfredo Pareto ([1909]1927) first formulated the concept. Hicks acknowledged

possibility of credit, it simply asserts that the household's total spending plan cannot exceed its budget constraint, namely the total expected monetary revenue at its disposal. Kornai extended the concept of budget constraint to the firm's behavior.

For a long time, the budget constraint has been considered a *bookkeeping identity* (Lange, 1942; Samuelson, 1948). Budget constraint was first treated as a 'rational postulate' of a household's 'planned' (intended) behavior by Clower (1965) and Clower and Leijonhufvud (1981).¹³ Clower (1965) applied Say's Principle (SP) as synonymous with budget constraint and tried to clarify the prevalent confusion among economists between SP and Walras' Law.¹⁴

According to Clower and Leijonhufvud (1981, p. 80), Say's Principle (SP) only states that "...the net value of an individual's *planned* trades is identically zero." They intentionally did not refer to the 'net *market* value,' because SP only states that a household's 'expected' or 'planned' purchases cannot exceed its 'expected' or 'planned' revenues. Trades considered by Clower to be 'theoretically admissible' are not *actual market* trades. In this respect, prices and quantities are also included in the context of 'mental experimentation' and refer to 'expected' purchase prices and 'planned' quantities and not to quantities actually purchased or prices actually paid (Clower and Due, 1972, p. 64).

Kornai redefined budget constraint (BC) as an *empirical fact* instead of a *rational postulate*. While the distinction between *hard* and *soft* budget constraints is meaningless in standard microeconomics (Kornai 1979b, p. 806), it describes two different behavioral regularities in Kornai's theoretical construction. Kornai's HBC amounts to what standard microeconomics consider to be a budget constraint. But this is only *empirically* held under a 'pure' competitive capitalist economy. Conversely, the budget constraint is *soft* under a socialist system where "socialist firms are bailed out persistently by state agencies when revenues do not cover costs" (Kornai, 1998, p. 12).

primarily Pareto, and Slutsky (1915), and all later users of the budget constraint concept apparently drew on the same source (see, for example, Kornai, 1980). The budget equation in Hicks (1939, p. 305) bears a close resemblance to Pareto's "budget of the individual" ([1909]1927, p. 160; [1911] 1955, p. 90) and Costa (1998, p. 137) conjectures that constrained utility maximization entered standard price theory by way of Pareto. The modern versions of the concept were first developed by Hicks (1939) and Samuelson (1948); it was then introduced by Arrow-Debreu (1954), Debreu (1959), and Arrow-Hahn (1971) in general equilibrium theory. Patinkin (1956) integrated it in his monetary theory of general equilibrium.

¹³ In these articles, Clower and Leijonhufvud demonstrate that neoclassical price theory may be regarded as a special case of Keynesian economics, and is valid only under conditions of full employment.

¹⁴ 'Say's Principle' or 'Say's Law' is an old subject of controversy among economists. Schumpeter (1954, Vol. 3, Chap. 6) and Sowell (1972) summarized Say's Law in six propositions. Baumol (1977) quoted Say at length, arguing that at least eight different 'laws' or formulations can be derived from Say's works. Lange (1942, p. 64) argued that application of Say's Law to a barter economy is a particular case of Walras' Law that applies to a money economy. This argument has been criticized by Clower and Leijonhufvud (1981, pp. 97–98). Finally, Wood and Kates (2000) published five edited volumes regarding different critical assessments of Say's Principle by specialist economists; these are invaluable references. Here, what really matters is not the historical clarification between different versions of Say's Principle or Say's Law, but whether Say's Principle (as an equivalent of budget constraint) describes a *bookkeeping identity* or a *rational postulate* of an individual transactor's behavior. In this perspective, the distinction between Walras' Law and Say's Principle becomes crucial.

This distinction at the microeconomic level suffers from a fundamental shortcoming. While the application of the standard microeconomic budget constraint (or Kornai's HBC) does not require *any transfer* between individual economic units, the SBC implies *macroeconomic income redistribution*. This makes it difficult to understand why Kornai classifies his concept only within *micro* theory (Vahabi, 2014). Nevertheless, the treatment of budget constraint as an *empirical fact* is an entirely heterodox original concept that is in conflict with both notions of budget constraint in standard microeconomics, i.e. budget constraint as a *book-keeping identity* and budget constraint as a *rational postulate*. Kornai (1979b, 1980) explains this *empirical fact* by *institutional conditions*. The adoption of an institutionalist approach is another major heterodox turn in Kornai's thought since the end of the seventies.

Kornai (1979b, p. 817) explains this new orientation in an ambiguous way: "The explanatory factors that I considered the main cause of suction in *Anti-Equilibrium* stayed a role also in the present analysis, but only secondarily. 'Weighting' of the causes has been rearranged. I consider now the main cause of suction the institutional background, concretely: softness, of the budget constraint." But softness of budget constraint is a behavioral regularity, and it seems here that Kornai is interpreting 'behavioralism' as institutionalism. In fact, Kornai (1980) defines 'soft budget constraint' as an *economic* and *not an institutional* phenomenon¹⁵. He removes this ambiguity in Kornai (1980, p. 556): "Ever since I have been doing economic research, the interdependence of the following three groups of phenomena has always interested me: (a) chronic shortage; (b) economic policy improving a fast rate of growth by every means; and (c) certain institutional relations: a high degree of centralization, multilevel control, administrative rationing, and the subordinate role of money and prices. How do these react? Which is the cause and which the effect? Or, to put it less sharply: which elements in the system have a primary role and which only a secondary role? In two of my earlier works, *Anti-Equilibrium* and *Rush versus Harmonic Growth*, I regarded phenomenon (a) and (b) as primary. Many were opposed to this view emphasizing that it is the group of phenomena in (c) that plays a primary causal role. It appears from my present book that I am now inclined to accept this view. The main explanation of chronic shortage lies in the institutional conditions, and the behavioral rules they lead to." Kornai is referring to the Hungarian institutionalist economists particularly Tamas Bauer's (1973) critique of *Anti-Equilibrium* for the lack of an institutionalist perspective.

Institutional relations are now clearly related to paternalism or *bureaucratic coordination mechanism* (other forms of *coordination* such as market, ethical or aggressive) that have been defined later in Kornai (1984)¹⁶. However, power and property relationships are not yet mentioned. This partial institutionalism is in line with what Kornai called the "soul" of systems theory in *Anti-Equilibrium*.

¹⁵ Kornai (1980, p. 569) avers: "*There is a close relationship between the set of economic phenomena in the strict sense (the soft budget constraint, almost-insatiable demand, horizontal and vertical "pumping") and the set of institutional phenomena (the higher degrees of paternalism): the latter set largely explains the former one.*" Kornai clearly maintains that 'behavioral regularity' is decided by institutional conditions: "The book has throughout reflected the view that *definite social relations and institutional conditions generate definite forms of behavior, economic regularities and norms.*" (Ibid, p. 569).

¹⁶ Other forms of *coordination* such as market, ethical or aggressive have been defined later in Kornai (1984). Kornai's description of institutions or coordination mechanism is inspired by Karl Polanyi's social forms of integration, namely exchange, redistribution, and reciprocity (see Vahabi, 2009).

Summing up Kornai's position on GET in this second phase, we find him again half-in, half-out of the mainstream. Although he becomes more 'neoclassical' by redefining *disequilibrium* in terms of *Marshallian equilibrium* and by adopting a *microeconomic* orientation in explaining macroeconomic aggregates, his insistence on an empirically based microeconomics, his soft budget constraint and institutionalist approach reflect his heterodox position. While 'system paradigm' is only tangentially treated in Kornai (1980), the new institutionalist orientation influences Kornai's pursuit for systems economic theory from a methodological perspective.

4. By Force of Thought: from Marshallian to Walrasian equilibrium

Kornai's autobiography is the coup de grace for the main message of *Anti-Equilibrium*: "I began the section by pointing to an essential mistake in the domain of the philosophy of science in *Anti-Equilibrium*. I should have attacked not the purity of the theory (the abstract, unreal nature of its assumptions), but the wrong use of it in mainstream economics. The real addressee of the critique should have been *mainstream teaching practices and research programs*." (Kornai, 2006, pp. 184-185). There is no trace of *disequilibrium* or 'normal state' in this self-critical appraisal. The distinction between Walrasian and non-Walrasian equilibrium is equally disregarded, since Kornai has now come to accept GET as a normative model. Accordingly, he acknowledges the failure of his project to 'revolutionize' GET and accepts Frank Hahn's criticism and call for 'reforms': "Looking back today, I consider that revolutionary approach to have been mistaken.(...) When writing *Anti-Equilibrium*, I undervalued the willingness and ability of mainstream economics to renew itself." (Ibid, p. 192). Here we find a third phase in Kornai's thought on equilibrium during which Kornai goes beyond the defense of equilibrium in a broad sense (i.e. what he calls 'normal state' or Marshallian equilibrium) and becomes an advocate of equilibrium in its narrow or Walrasian sense. He now claims that GET, in its purity, provides an abstract reference for market efficiency. The problem is rather the way GET has been taught and the manner research projects have been tailored.

Kornai also revises his position with regard to the 'rationality postulate': "Given the line of argument just expressed, the extreme model that assumes a rigorously consistent decision maker can do useful service. It can serve as a standard for establishing what inconsistencies are apparent in a real decision maker's behavior-in what decisions, in what direction, to what degree, and with what frequently it departs from that of an ideally consistent decision maker. It is regrettable that *Anti-Equilibrium* did not appreciate that valuable role sufficiently." (Ibid, p. 185). Kornai is no more against the use of maximizing assumption in describing human behavior on economic issues; he completely disregards Simon's 'satisficing' criterion employed in some of his coauthored formal models (Kornai and Weibull, 1983b).

Borrowing again Hahn's definition of the 'neoclassical' school, Kornai (2006) might be classified as a neoclassical economist, since he adheres to all three elements of Hahn's thought, namely *microeconomic* orientation, *rationality* postulate and *equilibrium* (both Marshallian and Walrasian). In this sense, he goes with the stream, but the mainstream of 'neoclassical synthesis' does not play an influential role in the era of the New Classical School (Rational Expectations and Real Business Cycles, see Snowden and Vane, 2005; de Vroey, 2016). The new mainstream of

rational expectations and economic imperialism marks the end of the ‘neoclassical synthesis.’ According to the New Classical School, Walrasian general equilibrium is not only a normative model of competitive markets, but also a description of the way markets function in reality. All forms of disequilibrium are assumed to be a reflection of an intertemporal adaptation to external shocks rather than lack of coordination among decentralized agents. Kornai’s critical stand towards “mainstream teaching practices and research programs” addresses this new mainstream: “Among the readers of the Hungarian edition of this book, I found some who thought that my criticism here of the mainstream in teaching and research applied far more to the *present* state of affairs, the period after the theories related to “rational expectations” became very influential, than to that of thirty-five years ago, when I was writing *Anti-Equilibrium* received later recognition for pointing ahead to likely problems.” (Kornai, 2006, p. 185). In other words, although *Anti-Equilibrium* was not a valid criticism of GET, it correctly predicted and provided an appropriate critique of today’s mainstream economics.

Again on rational choice theory, Kornai (Ibid, p. 186) implicitly criticizes Chicago School of economics because of its non-subtle use of the model in explaining all non-economic human behavior: “Exponents claim to have a *universal* explanatory model of human behavior on their hands, able to describe anything-not just narrowly economic decisions but all problems of choice, from divorce and family size up to parliamentary votes.” Rejecting the extension of economic assumption of rational-choice behavior to all other fields of social sciences, Kornai underlines: “The rational choice model has begun to be widely employed in sociology and political science, and even in history...Unfortunately, in these disciplines the theory of rational choice is not used in the subtle way suggested above. Because its interpretations are often quite crude and oversimplified, the warnings and criticism of several decades ago have not lost their immediacy” (Ibid, p. 188). There is a problem with Kornai’s critique of extending rationality assumption to other fields of social science. Kornai was one of the first protagonists and users of Game theory. This “qualitative mathematics” (Lévi-Strauss, 1954, p. 647-48; Braudel, 1958, p. 746) was applied to different fields of human and social sciences, notably in linguistic, communication, theoretical biology, politics, anthropology, military science, economics, sociology and even in literature and critical analysis of evangelical texts. Game theory has been extensively used as a common tool in different disciplines on the basis of rational players. Formal reasoning particularly game theory was one of the major sources of resorting to the rationality assumption in an interdisciplinary perspective. Given Kornai’s interest for game theory and his constant collaboration with game theorists including Eric Maskin and Gérard Roland, it would have been useful if Kornai could clarify whether he is against the adoption of rationality assumption in game theory applied in other fields of social sciences. Unfortunately, Kornai leaves this question unanswered.

In sum, according to Kornai (2006), he is a neoclassical but not a New Classical. However, there are two problems for which we do not find any clue in Kornai (2006). The first one is *economic systems theory*; and the second one is *soft budget constraint*.

As noted earlier, the sub-title of *Anti-Equilibrium*, is *On Economic Systems Theory and the Tasks of Research*. GET was presented as part of a new branch of economics devoted to economic systems theory. Kornai (1980) adopted an institutionalist approach in analyzing economic

relationships. *The Socialist System* (1992) and Kornai's other writings on post-socialist transition are focused on 'system paradigm' within an institutional perspective. What is the place of GET within an institutional perspective of 'system paradigm'?

A second problem is related to the notion of the soft budget constraint as an *empirical* fact. How can soft budget constraint as an empirical fact be reconciled with GET?

5. Kornai and New Microeconomics

Soft budget constraint (SBC) is irreconcilable with standard microeconomics, since rational agents would never violate their budget constraints as either *book-keeping* identity or a *rational planning postulate* (Say's Principle). Contrary to standard microeconomics, new microeconomics is based on strategic behavior of agents interacting with other agents. The SBC can be integrated in new microeconomics as a more general dynamic commitment problem in which an agent can fail to take an efficient action, or can undertake an inefficient action, because he knows that he will receive additional financing. Dewatripont and Maskin (1995) pioneered this *endogenous* explanation of SBC. They argued that the SBC syndrome occurs whenever a funding source (e.g., a bank or government) finds it impossible to keep an enterprise to a fiscal budget (i.e., whenever the enterprise can extract a bigger subsidy *ex post* or loan more than would have been considered efficient *ex ante*). In this sense, the SBC problem is not specific to socialist economies, because the extent to which loss-making firms or projects are terminated or refinanced is also very relevant in capitalist (both developed or undeveloped) economies. In short, *time inconsistency* of the Centre lies at the heart of the SBC syndrome: if the Centre were able to *credibly commit* not to subsidize a firm *ex post*, the firm would make more efficient *ex ante* decisions. Hardening of the budget constraint then means creating conditions for a credible commitment not to refinance an agent.

Since the pioneering work of Dewatripont and Maskin (1995), an abundant body of formal literature has explained the SBC endogenously through adverse selection, moral hazard, and rent-seeking (for detailed surveys, see Maskin, 1996; Kornai, Maskin and Roland, 2003; Vahabi, 2001, 2005, 2014). The SBC is thus integrated into the new microeconomics as a special case of time inconsistency. Nonetheless, these *endogenous* versions of the SBC and Kornai's *exogenous* version of the SBC as the *ex post* bailouts of loser firms by a paternalistic state still differ fundamentally. To clarify the difference, we can simply ask what would happen if, *ex ante*, the creditor knows with certainty that the firm will be a loss-maker.

In all endogenous models of the SBC, "if a creditor learns *ex ante* that the firm is definitely a "bad" firm, it will refuse to finance it since to do so would be throwing money away. This is in sharp contrast to a model of *ex post* bailouts due to paternalism because in such a model the likelihood of obtaining financing is unaffected by *ex ante* revelation to the creditors that the firm is expected to be loss-making. If the firm is loss-making *ex post*, it is subsidized as a result of its situation and, consequently, the firm has a soft budget constraint." (Schaffer, 1998, p. 84). In other words, Kornai and Maskin are not talking about the same thing.

While Maskin's endogenous SBC fits within profit-maximizing behavior and is consistent with the new microeconomics, Kornai's theory of the SBC is inconsistent with profit-maximizing behavior. "In describing the behavior of the firm, we want to have a more general framework than

the usual profit-maximizing pattern (...) In addition, we apply -following Simon (1959) - the satisficing model of decision-making. This approach seems to be *more general and realistic*, and in the present model profit maximizing appears as a special case of the more general pattern” (Kornai and Weibull, 1983b, p. 166).

For Maskin, soft budget constraint is the outcome of a *choice* related to strategic behavior of a maximizing agent in the absence of credible commitments. By contrast, for Kornai, soft budget constraint is an *empirical* fact generated by *institutional constraints*. The theoretical synthesis between formal and institutional explanations of the soft budget constraint as suggested by Kornai, Maskin and Roland (2003) is theoretically incoherent since the concept of soft budget constraint is not the same in exogenous and endogenous explanations (Vahabi, 2014). A ‘half-in’, ‘half-out’ of mainstream ‘synthesis’ is rather a source of confusion obfuscating the heterodox message of Kornai’s original concept of SBC.

Conclusion

Undoubtedly, Kornai is one of the eminent economists of the twentieth century who demystified the socialist economy as a shortage economy. Bridging the Eastern and Western economists with regard to GET is only one of his contributions. More importantly, he is one of the pioneers of system paradigm, and the inceptor of soft budget constraint that has been a major source of theoretical inspiration and policy-making implications for many international organizations (like IMF, World Bank) during the post-socialist transition. His ideas on ‘investment hunger’, ‘soft budget constraint’ and the ‘state paternalism’ influenced the Chinese economic reform since the Bashan Conference in 1985 (Gewirtz, 2017). It is not by chance that he could publish in all leading economic journals, orthodox or heterodox. It is surprising that the Nobel Prize has never been granted to a scholar whose name is closely associated with the intellectual preparation of the most important economic transition of the post-Cold war period, namely post-socialist transition.

Reviewing the chapter on *Anti-Equilibrium* in his auto-biography reveals some of the reasons behind this enigma: “I certainly caused several difficulties in my later career by writing and publishing *Anti-Equilibrium*. It was seen as unforgivable by some diehard, blinkered members of the neoclassical school.” (Kornai, 2006, p. 195). In Kornai’s self-critical appraisal, his misleading critique of GET was partly the cause of his ‘failure’, but mainstream economics should also bear another part of the responsibility because it treated Kornai’s errors as unforgivable blasphemy: “In this chapter-as in other parts of the book-I have striven for honest introspection. I have tried to find out how much responsibility I bore for *Anti-Equilibrium*’s not achieving the effect I had expected it would. Among other things, this honesty gives me the moral basis to ask, “Can the lack of success be attributed *only* to me?” It is not ill-feeling that makes me seek an answer to this question. I am speaking for many researchers when I broach the issues of the profession’s refusal to accept heavy criticism and of its shortness of memory; that memory ought to honor the first appearance of important- primitive, clumsy, but nevertheless pioneering- new ideas.” (Kornai, Ibid, p. 197). The dogmatic and sectarian spirit of mainstream economics is a whole chapter that warrants a thorough study of the sociological and theoretical evolution of economists as a “caste” (Schumpeter, 1954) and economic profession as institutionalized knowledge. In this conclusive part, I would like to return to the cause of Kornai’s so-called ‘failure’. Kornai’s intellectual honesty

is exemplary; he always reexamines his earlier positions and if he finds them wrong, he explicitly acknowledges them. It needs a lot of theoretical courage and personal integrity to admit that Hahn (1973) was right in his critique of *Anti-Equilibrium*. No one could describe better than Kornai himself his relationship with mainstream economics: “On some questions I go with the stream, and in other cases I try to swim up the stream. This half-in, half-out situation sometimes causes conflicts.” (Kornai, 2006, p. 195). Is there any relationship between Kornai’s “half-in, half-out situation” and his so-called ‘failure’?

It is true that although Kornai’s *Anti-Equilibrium* was very close to post-Keynesian economics, he did not treat ‘equilibrium economics as irrelevant’ (Kaldor, 1972). He tried to bring together ‘economic systems theory’ with ‘equilibrium economics’, and the outcome of this half-in, half-out position was nothing but a ‘failure’. Kornai started by ‘disequilibrium’, then accepted ‘Marshallian equilibrium’ and finally ended up with ‘Walrasian general equilibrium’. In fact, this long journey was related to his initial choice of taking ‘equilibrium economics’ as *relevant*, although he never showed the relationship between GET and economic systems theory. Did Kornai need to entertain such a ‘half-in’ position with GET to develop his theory of soft budget constraints? The same question can be raised again when he lends credence to a synthesis of formal and institutional theories of the SBC.

Kornai’s work is colossal and whatever his tactical choice in introducing his ideas, both orthodoxy and heterodoxy would need him to enrich the way they understand the economic world.

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