The Basic Entities of Economy

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1. Introduction

In this paper we explicate six basic concepts for the analysis of economic systems and of economic actors. We propose to view economy as a playground comprising an external environment, system, actors (individuals and collectives) and forces which cause changes. In section 2 we explicate three structural entities: In section 3 we explicate other three basic concepts, dynamic entities of basic forces: In section 4 we present empirical interpretations of our methodological-conceptual analysis. In section 5 we present some implications.

2. The Building Blocks of Economy

The social sciences use explanations in terms of both agential entities and nonagential entities. The latter will be called 'system':

![Diagram of agential and nonagential entities]

Agential entities can be ascribed predicates such as intentions, goals, plans etc. Systems, on the other hand, cannot be ascribed such predicates. It makes no sense to say that the market wants to equalize prices or that the traffic rules have the intention to regulate drivers' behavior. Thus, we usually say that agents act, intend, etc., while system function in certain ways.

Definitions:
1. a system: an entity which is based on regular connections between at least two entities.
2. an agent: an entity which has the ability to act (an agent can be an individual or a collective).
3. an action: a process of intentional change of an environment according to a given plan, in order to fit that environment to that plan.

The relations between systems, collectives and individuals, will be explained through the following two basic rules:

Two basic rules:
1. Collectives and individuals can build and change, in the long run, social systems; social systems, on the other hand, constrain, coordinate and homogenize the actions of collectives and individuals.
2. Individuals can constitute and change, in the long run, collectives; collectives, on the other hand, constrain, coordinate and homogenize the actions of individuals.

Consider, for instance, the actions of drivers. They are constrained not only by the geographic pattern of the highways, but also by the regulations of the traffic system. When a driver sees a red light he stops the car, just as when he sees a huge rock in the road. Because of its constraining power, the traffic system also coordinates and homogenizes the driver's actions. In the opposite direction, it is clear that individuals and collectives are those who build and change the traffic system.

Our model for exemplifying the basic entities and their relations will be that of a game, let's say a football game. The game is played in a playground, according to a set of rules. The playground has an external environment (e.g., the apartments where the actors live) which has input-output relations with the playground. In the playground collectives (football teams) and individuals (players, the referee, etc.) play. Between the actors there are interactions and transactions (kinds of exchange) of a medium (e.g., the ball) regulated by certain rules. The playground and the rules that stipulate the relations between the agents in the game constitute a system. From a non-agential point of view we can see the exchange as an energy flow (including the flow of information) between the elements in the system.

3. Forces in the Economy

Marxists and Weberians talk about the relationships between power and capital.
Marxists argue that power is a component of the superstructure while capital is a component of the infrastructure. Thus, an inequality in capital determines inequalities in political and military power. Webersians don’t agree and argue that political power can induce change in the domain of capital inequalities. Marxists and Webersians have a similar dispute concerning the relationships between knowledge and capital (or cultural factors and capital).

Sociologists of knowledge, philosophers of science (Foucault, 1977) and theorists of information (Bell, 1980) analyze the relations between power and knowledge. Here we also have disputes concerning the question: does power determine knowledge or the other way around (see Idan 1986)? Such disputes are flawed by their reductionistic pretensions.

Just as a non-reductionistic analysis of the triad individual/collective/system, is warranted (cf. Dascal & Idan, 1990), so too we need a non-reductionistic analysis of the relations between capital/knowledge/power. Wallerstein (1979), Amin (1977) and Burns et al. (1986) analyze fluctuations in the world system in terms of capital/power/knowledge. They acknowledge - just as Marxists and Webersians - that these three factors are the dynamic entities responsible for social and economic change. But they are not aware of two important points: 1) The nature of these three concepts; 2) The relationship between the complex capital/knowledge/power and the complex individual/collective/system.

We will begin by explicating the nature of the three kinds of forces and then examine the relations between the two triads.

One can distinguish between a systemic-naturalistic approach to the concept of power and an interactionistic-game-theoretical one. While the former treats power as a predicate of a given system in physicalistic terms, the latter treats power as a predicate of agents (individuals or collectives) in interactional terms. According to the first approach (which is a kind of synthesis between Klein (1975) and Burns et al. (1976), power (p) will be a function of the “mass” (m) (of a firm, a nation, or a system) and the “acceleration” (a).

(1) \[ p = m(a + a) \]

What is that mass? What is that acceleration? The mass of a certain social entity is a function of its population and of its area. There are two kinds of acceleration of a given social entity: acceleration of knowledge \( a_k \), acceleration of capital \( a_c \) (see also Knorr (1970)).

(2) \[ p = m(a_k + a_c) \]

Acceleration is the rate of growth; \( a_c \) is the rate of growth of capital. In the long run acceleration is the determining factor of the power (p) of a given economic entity. Germany and Japan in the last two decades have increased their power due to the remarkable positive acceleration of their gains in capital and knowledge. By comparison, the USSR has had, in the same period, a negative acceleration and the same may also be true of the U.S. (see also Kennedy, 1987) in the last two years.

In physics, ‘work’ is a function of power and distance.

(3) \[ W = p.s \]

In the dynamics of social entities and energies, energy will be defined in a similar way. We already defined power, so we have to explicate the meaning of “economic distance” (s). Consider, for instance, the world system (WS) (see Wallerstein, 1979). Distance will be defined in terms of the “distance” between the center and the periphery in the world system. Intuitively and qualitively we can see that one needs more force “to move” a given peripheral state (with a given power) to the center than to the semi-periphery of the WS (to the middle of the road). For example, more force is needed “to move” Angola or Panama to the status of Belgium, than to move them to the status of semi-peripheral state like Israel.

From (2) and (3), we get:

(4) \[ W = p.s = m(a_k + a_c)s \]

There are three kinds of social ‘forces’ which are interrelated mathematically. The relation between the kinds of forces is problematic since power, for example, is not only dependent on capital and knowledge. The institutions of power (mainly political and military ones) gain during their development a relative autonomy and thus achieve semi-independent existence. The relative autonomy of the military force from economic and from scientific/technological force poses a problem regarding the meaning of the sign ‘-’ in equations (2) and (4). We can overcome this obstacle by rewriting these equations as:

(2') \[ p = K.m(a_k + a_c) \]

(4') \[ p.s = K.m.s(a_k + a_c) \]

In our new equations, power is represented as a certain function of knowledge and capital, but it is not a simple sum of knowledge and capital. B. B. B. B. et al. (1985, 223) and others have noticed the problematicity of the mathematization of the social sciences (econometric, politometric, sociometric, etc.). The direction for the solution
of this problem is the insight that formulae, equations, and the meaning of terms in equations are context-dependent. This context dependency is expressed in the transformation of the equations.

\[ 2 \rightarrow 2' \quad \text{and} \quad 4 \rightarrow 4' \]

In \(2'\) and \(4'\) \(K\) is a ‘constant’ which changes its value in different contexts or in different periods.

Thus the relative autonomy of political/military power can be expressed in the different values of \(K\):

\[ K = \frac{p}{m(a_1 + a_2)} \]

When political and/or military power dominate knowledge and capital \(K.m > 1\). When \(p\) is still embryonic and dominated by knowledge/capital, then \(K.m < 1\).

Friction and collisions reduce the velocity of physical bodies (i.e., they introduce in the moving system a negative acceleration. There are also “economic friction” and “economic collisions.” When a given social entity tends to move towards the center of the world-system, its velocity can be reduced, in the long run, by military expenditures (friction) and by wars (collisions).

Such factors, to the extent that they are independent of \(a_1\), \(a_2\) and \(m\), can be represented in our equations as further contextual modifications of the constant \(K\). Thus, in the context of the current Gulf crisis, promoted by Iraq’s invasion of Kuwait, the sheer volume of military expenditure involved in deploying American forces in the area acts as a “friction” factor, reducing the value of \(K\), and preventing – in the long run – the full exercise of “ideal” American military power.

Our analysis in terms of forces which move masses in the “economic space” has relied so far upon the notion of distance as defined in the world system. It may thus work well at the macroeconomic level, of international political, military and economic relations. But how is this analysis to be interpreted at the microeconomic level, say of firms and individual decision makers? If the macrospace is the set of “distances” between the periphery, the semiperiphery and the center of WS, what is the microspace? One example of microeconomic space for firms is the space defined by lists such as that of the five hundred U.S. biggest industrial corporations. This space has quantified dimensions such as volume of sales, profits, assets, market price, etc., in terms of which the “distance” between the firms is well-defined.

Clearly, knowledge and capital are forces that can “move” firms from one position to the other in the list. Political power – e.g., in the form of lobbies – is also an acknowledged force, though less talked about. As for military power, though \textit{prima facie} absent from this space, it should not be entirely disregarded either, pending further investigation on the matter.

As for individual decision makers, say, within a firm, a good candidate for defining the set of distances/relations that constitute a relevant microspace is the hierarchical structure of their firm. In such a space, individuals are seen as aspiring to climb up the hierarchical ladder, and conceivably their ability to do so will depend on knowledge, capital and political (as well as ‘military’) ‘elbows’. However, here too the influence of such factors will depend heavily on context: the value of \(K\) is likely to vary not only from firm to firm, but also by virtue of variations in the external environment where the firms operate.

4. Empirical Manifestations of the Entities

The ‘reality’ of the six entities presented above in an abstract way is confirmed by interpreting them in terms of classical analyses of levels of power, economic cycles, the growth of knowledge and historical time. To see this, it suffices to recall briefly four such analyses, and tabulate them in terms of our unified account. The four analyses considered are:

1. \textit{Wright-Mills’ (1962) political theory of the three levels of power.}
2. \textit{Kondratieff’s (1935) economical theory of three levels of capital fluctuations (cycles).}
3. \textit{Lakatos’ (1970) theory of knowledge which is based on three levels of the growth of knowledge.}
4. \textit{Braudel’s (1980) historical theory of three levels of time.}

All the above mentioned theories deal with energy flow at three structural levels: the individual (or small group), the collective, and the systemic level.

According to Wright-Mills, the highest level of power in the U.S. is the systemic level, i.e., the power which is in the hands of the federal military-economic decision makers. The intermediate level of power is the collective level, i.e., the power of such communities as trade unions, ethnic lobbies, etc. The lowest level of power is the small group (or individual) level, i.e., the power of small and local communities.

According to Kondratieff, there are three
kinds of waves in the growth of capital. The longest wave takes 50-60 years, the medium wave takes 10-12 years and the short wave takes 2-4 years. These kinds of waves correspond approximately to three modes of economic-periodical crises. On our interpretation, the long wave is the wave of the growth and fall of a dominant economic system. Thus, it is a manifestation of crises at the systemic level. Kondratieff showed that there were four such waves (1780-1840, 1840-1900, 1900-1970, 1970-2030?).

The first wave can be interpreted as the manifestation of the rise and fall of the British economic system. The second is the manifestation of the German one. The third is that of the American one. The fourth is that of the Japanese-Chinese one.

The medium wave is the manifestation of the growth and fall of specific states. The short wave is the manifestation of the growth and fall of a specific economic-political plan of a certain government or a certain firm.

According to Lakatos the growth of knowledge was analyzed by philosophers of science at three levels. Popper, for example, analyzes the individual level which is the story of the rise of conjectures of a creative scientist and of their refutation by the scientist’s colleagues. Kuhn, for example, analyzes the collective level which is the story of ‘paradigms’ held by specific scientific communities and their replacement through ‘scientific revolutions’. Lakatos himself analyzes scientific-research programs which are long-term enterprises, which are upheld as long as they are ‘progressive’ and likely to be abandoned once they become ‘degenerative’.

<table>
<thead>
<tr>
<th>Entities/Forces</th>
<th>Power</th>
<th>Capital</th>
<th>Knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td>individuals or small groups</td>
<td>Wright-Mills Lowest level</td>
<td>Kondratieff’s short waves</td>
<td>Popper</td>
</tr>
<tr>
<td>collectives</td>
<td>W M medium level</td>
<td>K’ medium waves</td>
<td>Kuhn</td>
</tr>
<tr>
<td>Systems</td>
<td>W M high level</td>
<td>K’ long waves</td>
<td>Lakatos</td>
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The political system (power), the economic system (capital) and the scientific-technological system (knowledge) are subsystems of the bigger social system (Parsons, 1977) or of the world-system (Wallerstein, 1979). Braudel’s sociohistorical theory (1980) is a nonreductionistic theory which takes into account the dynamic of all the above mentioned three subsystems and of their integration into the general system. Thus, Braudel’s three levels of historical time are three levels of manifestations of the world system and of its subsystems. The first level is the short span of events which are connected to individuals and to small groups. This span can be measured in days and months. The second level is the medium span of processes which are connected to collectives and to subsystems. This span can be measured in years and decades. The third level is the long span of deep processes which are connected to world systems (the Mediterranean system in the Antiquity and Middle Age, the Atlantic system from the Renaissance to World War I, the world-system in our days). This span can be measured in centuries.

5. Implications

Our analysis is interdisciplinary and nonreductionistic. It is interdisciplinary since we analyze the relations between economic (Kondratieff), political (Wright-Mills) and historical (Braudel) theories. It is nonreductionistic since we take into account the relations between all the six basic entities and energies. These nonreductionism and interdisciplinarity enables us to present (in outline) the following new perspectives:

5.1 Kondratieff’s cycles can be seen as subcycles of “Braudel’s cycles”, since (according to the end of section 4 the economic system is a subsystem of the general social system (or of the world system)). Thus, Kondratieff’s four waves express the ups and downs of Western civilization or of capitalism.

Our interdisciplinary and nonreductionistic approach enables us to regard Kondratieff’s cycles as a (very well developed and qualified) model of all the other social forces. Thus, we should look for political cycles and scientific-technological cycles (Lakatos’s research programs?). Our approach also enable us to interpret kordatieff’s cycles in a wider sociohistorical content. Thus, sociohistorical sciences (history, political science, sociology, etc.) can enrich economics and can be enriched by it.

5.2 Batra (1986) predicts that we will face a
very serious economic crisis in 1989-92. He based his predictions mainly on the analysis of sixty years cycles in world-economy. Thus, Batra's predictions can be seen as an application of Kondratieff's framework for an economic diagnosis of our time. Batra's theory, like ours, is interdisciplinary and nonreductionistic. It is quite clear to us that some of his predictions are becoming reality in our days. This contrasts sharply with the predictions embedded in the reductionistic idealistic table about "the end of history."

5.3 Soros's (1988) complementaristic analysis (or what he calls "reflexive analysis") of the fluctuations of the stock-market is another example of a nonreductionistic analysis. It takes into account the influence of all the three forces we discussed on the stock-market. It also takes into account the interrelations between the actors and the systems in the stock-market. In pure economic terminology, Soros suggests to the investor or to the analyst to find the golden middle between the "technical-economic systemic deep trends" and the "psychological-voluntaristic agential surface trends."

5.4 Capital, knowledge, and power are three forces which move social systems. These three forces can be converted into each other; capital can be "translated" into political powers, knowledge can be "translated" into capital, etc. Thus, methodologies of one discipline can enrich the theories of other disciplines. For example, qualified and exact methods which come from economics can be applied to learn about the growth and flow of "scientific capital" (knowledge) and of "political capital" (power). Methods of the philosophy of science (e.g., the methodology of scientific research programs or of paradigms) can be applied to learn about economic policy programs, economic policy paradigms, political action programs, and political action paradigms.

Bibliography