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Institutions, Strain *and the Underground Economy*

by Daniel Daianu and Lucian Albu

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Abstract

The paper interprets the dynamics of the underground economy in a transforming environment by highlighting the role of institutions in enforcing the rules of the game and the phenomenon of *strain*. A basic idea is that the underground economy emerges as a means for the system to diffuse its internal *strain*; the underground economy operates as a homeostatic mechanism which helps the system survive temporarily --as in the case of a command economy—and affects the structure of output according to consumers' preferences. In the same vein can be judged the emergence of unofficial activities in an over-regulated system be it market-based. Part one deals with the command economy and its specific institutions (rules of the game) as a glaring example of neglect of consumers' preferences and as a system developing endemic shortages. In such a system very intense *strain* emerges. Part two tries to explain *strain* during system transformation and its impact on the underground economy. In this case the magnitude of *strain* is related to dramatic changes in relative prices and the imbalance between exit and entry. Similarly relevant for explaining strain are the institutions in the making; still "soft" rules shape agents' behaviors and explain the resilience and the patterns of unofficial activities. Such is the case of *reputation seen as an asset*, and of the local standards of compliance with the legal framework. The last part applies empirical analysis, a model to the Romanian economy and speculates on the size of local unofficial activities.

Non-technical summary

The underground sector can be seen as an adjustment device (mechanism) of an economy under intense strain. The latter is caused either by the rules of the game --as in a command economy—or by dramatic changes in the parameters defining the functioning of an environment (relative prices). Moreover, strain is enhanced by institutional fragility. Whereas the underground economy is an outstanding structural feature of a command system (as a hyper-regulated entity which ignores consumers' and producers' preferences) it continues to exist in market economies as well --for as this paper argues, no economy can escape strain. The issue, therefore, is the intensity of strain and its malign effects. Subjected to dramatic changes in relative prices and showing much institutional fragility post-communist economies are under much strain. It is no surprise then that they evince substantial underground sectors. This paper argues that the exceptional magnitude of the required resource reallocation and the fragility of the new institutions (the *softness* of formal rules) stimulate the development of hidden sectors. In this context the way individuals view their *reputation* (seen as an asset) can be indicative of the *softness* of rules. The paper tries also to evaluate empirically the size of the underground economy in the case of Romania.

INSTITUTIONS, *STRAIN* AND THE UNDERGROUND ECONOMY[1]

by

Daniel Daianu and Lucian Albu[2]

This paper attempts to interpret the dynamics of the underground economy in a transforming environment by emphasizing the role of institutions in enforcing the *rules* of the game and the phenomenon of *strain*. A main idea is that the underground economy emerges as a means for the system to diffuse its internal *strain*. Thus, the underground economy operates as a homeostatic mechanism which helps the system survive temporarily --as in the case of the command economy--, and affects the structure of output according to consumers' preferences, in general. In the same vein can be judged the emergence of unofficial activities in an overregulated system be it market-based.

The first part deals with the command economy and its specific institutions (and rules of the game) as a glaring example of neglect of consumers' preferences and as a system developing endemic shortages. In such a system very intense *strain* emerges. Since the structural constraint of supply cannot be removed simply by freeing prices a total overhaul of the system is needed; this transformation would allow organized markets to function. The second part focuses on explaining *strain* during system transformation and its impact on the underground economy. In this case the magnitude of *strain* is related to the dramatic changes in relative prices and the imbalance between exit and entry. Likewise, the new institutions in the making (including regulations) and their role in the functioning of the underground sector in a transforming economy are under scrutiny. Still "soft" rules shape agents' behaviors and explain the resilience and the patterns of unofficial activities. Such is the case of *reputation* seen as an asset, and of the local standards of compliance with the legal framework. The last part tries to apply empirical analysis, a model to the Romanian economy and to speculate on the dimension of local unofficial activities.

It is worth to notice that the variant three of the empirical analysis supports official data which assess the size of the underground economy in Romania. It can be submitted that a major difficulty of applying conventional methodological tools to the case of transforming economies is related to the state (fuzziness) of propery rights, i.e, its impact on productivity in the official sector --which traditionally is assumed to be superior to the one evinced by the unofficial sector.

1. The structural constraint of supply and *strain*

Command economies, as institutionally arranged entities, are structurally supply-constrained systems, or what Kornai called shortage economies; they evince much *strain* as a manifestation of producers and consumers' efforts to cope with ubiquituous shortages. This strain brings about responses of the economy, as an aggregate, which defy planners' intentions and commands. The response of economy, as a living body, to controls and commands is made up of black markets - on which market-clearing prices operate - and unofficial activities; both these effects represent a homeostatic mechanism of adjustment. Whereas market-clearing prices affect, partly, the level of demand unofficial activities mitigate the pressure on the supply side. A presentation of the syndrome of the structural constraint of supply is made below.

1.1. Strain in a supply-constrained economy

When rational economic calculation is impeded, when there is centralized direct coordination of the interaction among economic agents and their motivational state is hardly

conducive to better performances, the generalized syndrome of soft-budget and the genetically related phenomenon of "the structural inelasticity of supply"[3] emerge as systemic features of the mode of functioning of the economy. This mode of functioning reveals a *structural constraint of supply*[4], which distinguishes it fundamentally from the mode of functioning of demand-constrained (market) economies.

The structural constraint of supply reflects itself in a series of tendencies and organically correlated processes which determine the quantity of friction in the economy and its aggregate (dis)equilibrium.

Firstly, there is the immanent drive that leads to the formation of aggregate excess demand which makes the structural constraint to appear in the already emphasized hypostasis of a constraint of resources. Several qualifications are to be made in this respect. Thus, the structural resource constraint does not imply that resources available are *fully* and efficiently used; for each agent (enterprise) the-constraint is felt at the level of the least available resources (or of best quality resource), so that a shortage of *mobilizable* resources coexists with a surplus of *non-mobilizable* resources - in a supply-constrained economy shortage coexists with slack" (Kornai, 1980, especially p. 30-36). A second comment regards the level of imput stocks considered as normal by the enterprise, which prove to be substantially higher than under the circumstances of a demand-constrained economy. A last qualification is linked with the appeareance of an *external demand constraint* in an open economy, which intensifies both shortage and slack.

Secondly, there occurs a gradual decline in the efficacy of the factors that can counteract a worsening of "inefficiency norms" in the economy. This tendency can be looked at and analysed from the standpoint of both allocative efficiency and microeconomic efficiency. It has to be stressed that the impressive *cost-overrun* (relative inefficiency) exhibited by supply-constrained economies expresses a relative incapacity to make goods use of the resources essential for an economic growth based on tehnical progress. In figure 1, which tries to depict this incapacity Q denotes the level of output, R(K,L) refers to capital and labor, and (G) indicates the innovational and entrepreneural potential of cociety. It can be seen that the same output can be obtained with different outlays of material resources (capital and labor depending on how the mode of functioning of the economy makes use of the innovational potential and *entrepreneurship* - Q^2 $(R_2(K, L), G_1)$ and $Q^2(R_1(K,l),G_2)$ symbolize the same level of output, but R_2 indicates a higher consumption of capital and labor than R_1.

Thirdly, there are *massive forced substitutions* of intermediate and final goods in production and consumption. This process has deleterious effects on both the efficiency of production and consumers' welfare.

Let us take a closer look at the consumption zone, where a hard-budget constraint is in force. Against the background of aggregate excess demand (repressed inflation) the structural imbalance between the supply of and the demand for commodities triggers the labor supply multiplier as an adjustment mechanism, which can be reinforced by an effort supply adjustment on the part of labor; i.e., when there appears an ever higher discrepancy between the efforts made by consumers to get their goods and the *apparent* real consumption a quantitative and qualitative adjustment of labor supply takes place. This fact can be illustrated by a change of the traditional effective labor supply function as below:

$$\overline{L}^s = L(\frac{W}{P}; \frac{M}{P}; L^d), \quad where \quad \frac{\partial \overline{L}^s}{\partial \frac{W}{P}} > 0$$

turns into,

$$\overline{L}^s = L(\frac{W}{P}; \frac{M}{P}; \varphi; \Phi) \quad where \quad \frac{\partial \overline{L}^s}{\partial \frac{W}{P}} > 0,$$

$$\frac{\partial \overline{L}^s}{\partial \varphi} < 0 \ , \quad \frac{\partial \overline{L}^s}{\partial \varphi} < 0$$

he additional notations being (φ) for a variable that denotes "the searching time" and "the queuing time"[5], and (Φ) indicates the utility (welfare) loss caused by forced substitutions in consumption .[6] In order to simplify the argumentation L^s defines also the actual effort supplied by labor in production[7]. It can be easily inferred that while the traditional effective labor supply function indicates a positive relationship between the evolution of the situation of a complete saturation of consumption needs, which is very unlikely -, the influence of an apparent rise in real wages on L^s can be more then counterbalanced by an intensification of the action of φ and Φ. The modified labor supply function does not include L^d as an argument, since we are dealing with supply-constrained economies - where the shortage of labor is very intense, in spite of a striking underutilisation of labor resources.
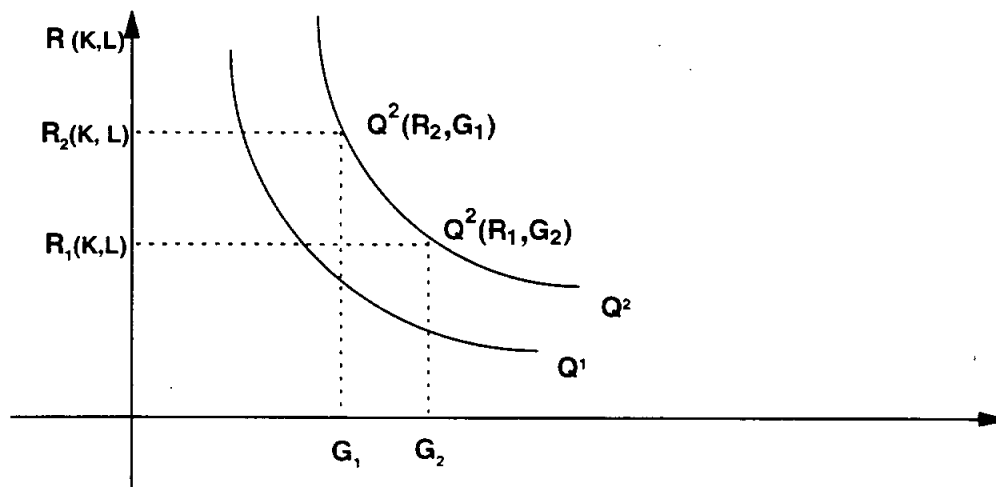

Figure 1

As emphasized, the structural imbalance between the demand for and the supply of goods and services has a considerably negative effect on the quality (utility) of consumption. To serve the purpose an example is used in which, though - at the ruling fixed prices- the money value of aggregate supply exceeds the money value of aggregate demand, the level of utility of consumption can decrease should the structural imbalance get more acute.
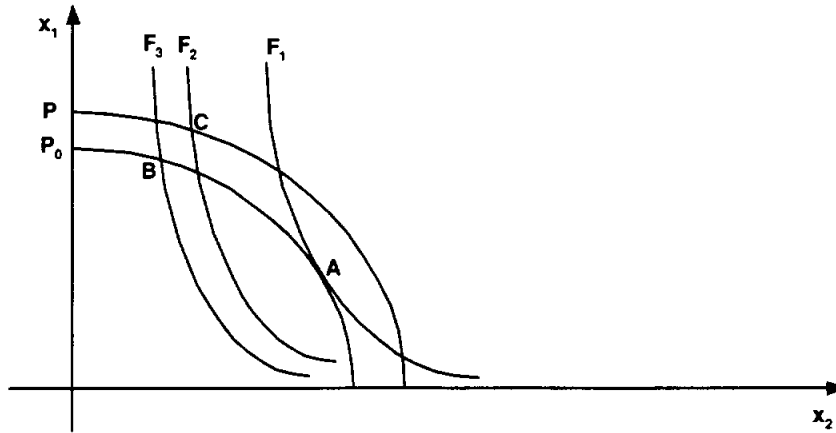
Figure 2

In Fig. 2 the level of utility given by the composition of output at $B(I^3)$ is inferior to the one at $A(I^1)$, which would reflect the structure of consumers' preferences. Even after production expands - the production possibility curve moves from P^0P^0 to P^1P^1 - the level of consumption utility at $C(I^2)$ stays further inferior to the one at A, though the money value of output at $C(q_{x1}, q_{x2})$ exceeds the one at $A(q_{k1}, q_{k2}.)$ At the ruling non-equilibrium prices (p_1, p_2) the following relation holds:

$$p_{x_1}q_{x_1}^c + p_{x_2}q_{x_2}^c > p_{x_1}q_{x_1}^a + p_{x_2}q_{x_2}^a$$

while, when equilibrium prices (p^*_{x1}, p^*_{x2}) are applied the sign of the relation is reversed:

$$p^*_{x_1}q_{x_1}^c + p^*_{x_2}q_{x_2}^c < p^*_{x_1}q_{x_1}^a + p^*_{x_2}q_{x_2}^a$$

Full flexibility of prices would not eliminate the structural constraint of supply in the zone of the economy where budget constraints are hard (consumption). Although the excess demand would tend to disappear - a tendency that can be slowed down or even annulled by the *sucking* performed by the agents (firms) facing soft-budget constraints - the structural inelasticity of supply would persist, so that producer's markets would continue to exist and, thereby, the seller's domination over the consumer would be felt no less strongly.

There is one aspect related to the process of forced substitution in consumption that needs more emphasis. In a demand-constrained economy the play of relative prices mirrors the comparative values (utilities) of goods and services, the choices and preferences of consumers. In a supply-constrained economy consumers are forced to purchase even products of very low saleability, which in the conditions of a buyer's market would go almost instantly out of production. Not only that the consumers' utility bought by a certain amount of money is much reduced through forced substitution, but there is an illusion created of a possible value equality

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between the aggregate demand for and the aggregate supply of commodities, through an administrative fixing (upholding) of the prices (values) of the range of goods of very low saleability. Here one deals with *false* prices (values), that create a false value equality between aggregate demand and aggregate supply.

Another process concerns the generation of "informational noise" in the system. Two aspects are significant in this respect. Firstly, a command system entails higher informational and transaction costs, which leads to a comparatively lower level of overall efficiency. Secondly, this system induces economic agents to "process" (distort) information so that their performances look better to their superordinates. It can be said that, in a chronic shortage environment, some externalities like trust, loyalty and truth-telling are in short supply as well.[8] Since "They are goods ... they have real, practical, economic value; they increase the efficiency of the system, enable you to produce more goods or more of whatever values you hold in high esteem" (K. Arrow, 1974, p. 23), their relative scarcity brings about an increase of the amount of friction (disequilibrium) in the economy as well as a reduction of its transparency, which makes peculiarly harder the evaluation of its aggregate performance.

1.2 Chronic shortage breeds the underground economy

The underground economy[9] is bred by chronic shortage. The luring force of the underground economy is given by the posibility to make a profit. As shown by S. Wellisz and R. Findlay, despite the handicap represented by "factor acquisition constraints" - that reduce the tehnical efficiency of the "parallel economy" - the posibility to make a profit exists, provided the cost of production is lower than the (unofficial) market clearing price, and as long as turnover taxes do not apply to the product (1986 p. 650). They also point out that this condition holds a fortiori " if we assume that the 'second economy' is either the sole producer, of the more efficient producer in the technical sense, of consumer goods and services" (Ibid).

The underground sector affects ambiguously the functioning of the economy, its aggregate performance. To the extent that higher gains can be obtained by undertaking unofficial activities (within the underground economy) resources will be diverted from the official economy; labor supply and working effort (both quantitatively and qualitatively) are reduced and various material inputs find their way to the underground economy, thereby causing a decrease of the output and efficiency of the official sphere of the national economy. On the other hand, an activation by the "parallel economy" of some non-mobilizable slack and of household resources can have a dampening influence on the decrease of output and of efficiency. The activation of parts of the non-mobilizable slack, especially, has a "lubricating effect" on the officaial economy, which helps its functioning.

The underground economy, though assumedly less efficient than the official economy, has a positive impact on consumers' welfare by supplying goods in very high demand. Therefore, on one side the parallel sphere has an ambiguous effect on the overall productive efficiency while, on the other side it makes possible a rise in the efficiency of consumption (consumers' utility). *This self-regulatory device[10] of the economy* - understood as living system made up of producing agents, who ask for what is due to them and act accordingly - points to a clear "second best" situation.

1.3 Evaluating aggregate disequilibrium (the potential underground economy)

Aggregate equilibrium, conceptualized in a strict sense, means the equality between aggregate demand and aggregate supply. In this narrow sense then, the existence of permanent aggregate excess demand points to the existence of aggregate disequilibrium, under the specific circumstances when the structural resource constraint operates in the presence of a large amount of non-mobilizable slack; which also means that one of the conditions of aggregation under quantity rationing is not valid, since shortages and slacks coexist on the same market. The important thing to underline here is that the unutilized resources are "frozen" (non-mobilizable in the run), which makes irrelevant the procedure of measuring net demand by netting out surpluses and deficits of resources. For as J. Winiecki stresses "there are no forces in the economy to produce equilibrium by reallocating excess supply to reduce excess demand" (1986, p. 201).

In a normative sense, in which it is construed as the loss of potential welfare for society[11] - or what can be called the "agregate performance deficit" -, aggregate disequilibrium considers the degree of overall inefficiency of the system and the forced substitutions in consumption. It can be expressed as:

$$\Delta U = U^* - \overline{U} = U(Q(L^*)) - U(Q(L^*, \overline{e}), \Phi)$$

where L* includes the labor supply diverted to (by) the underground economy, e (the overall degree of inefficiency) regards the non-mobilizable slack and the quantitative and qualitative underutilization of labor as well[12], and O regards forced substitutions in consumption. The expression above suggests, too, that in an command economy - viewed as a supply-constrained economy - the regulatory function of state autorities affects mainly the degree of shortage, through the composition of output decided by central-planners and the programmed rate of economic growth (the investment rate)[13]; it also influences the amount of labor force diverted to (by) the underground economy. This "shortage regulation" by means of policy-making is supplemented by the activities of the underground economy which acts as a self-regulatory device of the economy. Partial rearrangements within the institutional framework can influence (e), but its degree remains essentially determined by the systemic features of the economy.

2. "The UE in transition"; *strain*, the softness of rules (institutions) and *reputation as an asset.*

With the benefit of hindsight as well one can emphasize some main features of transition which bear on the dynamics of the underground economy. These features are, inter alia: domestic supply adjusts slowly in spite of the stimulus provided by market incentives; shortages disappear quickly because of price liberalization and imports; enacted rules are *soft*, which enhances the propensity of agents to ignore them, such as tax-evasion; prohibited domains still exist.

2.1 *Strain* in a transforming economy

Intense *strain* does not disappear in a transforming economy. Its origin can be traced to two main sources: the fragility of institutions in the making and the magnitude of the required reallocation of resources (Daianu, 1994, 1997). In what follows the focus is put on the second factor, namely, the ability of the system to react rapidly --via reasource realocation-- to the new set of market-clearing prices.

Once prices are freed and start to operate at quasi-equilibrium (market-clearing) levels, the hidden inefficiences come into the open and a massive resource reallocation would have to take place -- from low onto high productivity areas. More precisely, the issue refers to the possible and probable intensity of resource reallocation in view of constraints suchlike: the balance between exit and entry in the labor market, the size of the budget deficit and the means for its non-inflationary financing, social and political stability, etc.

Let us take the simplified case of a two commodity economy (figure 1). The initial production combination, (a_1, b_1), still reflects the central planners' preferences; the latter are indicated by the price line P^1. Were consumers sovereign, the production combination would be (a_2, b_2) and the price line denoting equilibrium (market-clearing) prices would be P^2.Took resource reallocation place without friction -- with no imbalance between exit and entry -- there would be no *strain* in the system; the shift from (a_1, b_1) to (a_2, b_2) would take place along the production possibilities curve.

In a real economy friction is unavoidable. Furthermore, the imbalance between *exit* and *entry* can be considerable, and it can cause the production combination A to be substantially inside the production possibilities curve -- the fall of the output of (a) is not accompanied by a corresponding growth of the output of (b). This means a significant reduction of aggregate utility -- from I_1 to I_2 -- if the expansion of the unofficial economy does not offset it. Over time the production combination would have to come ever closer to (a_2, b_2).

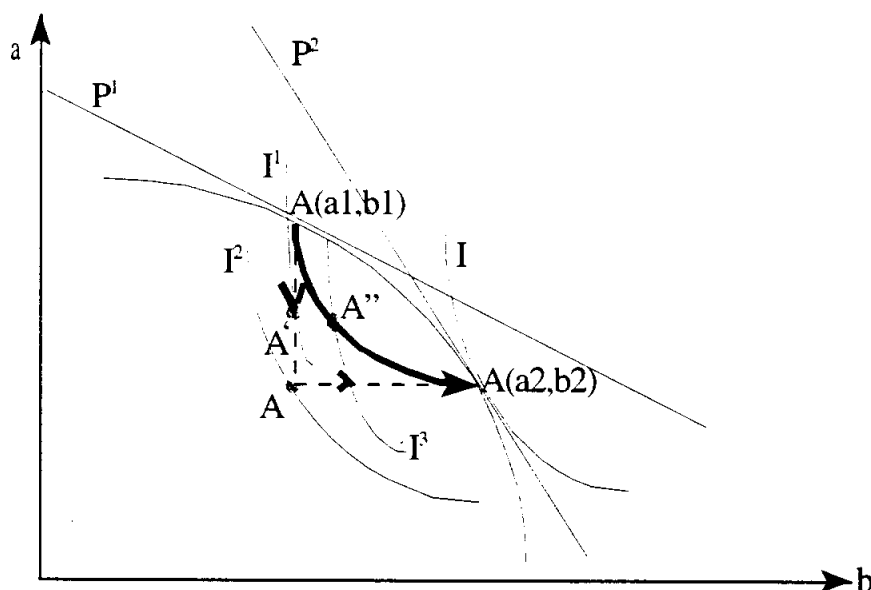This process is shown by the thick arrow in figure 3.

Figure 3: reallocation in a closed economy

The magnitude of the required resource reallocation can be illustrated by the ratio:

(1)
$$J = \frac{p_a^* |q_a^* - q_a| + p_b^* |q_b^* - q_b|}{p_a^* q_a^* + p_b^* q_b^*}$$

where (p*) and (q*) refer to equilibrium values, whereas (p) and (q) correspond to the current (distorted) resource allocation. J can be viewed as a measure of aggregate disequilibrium (in the system) as against the vector of equilibrium prices and quantities[3]. The general form of (1) is:

(2)
$$J = \frac{\sum p_i^* |q_i^* - q_i|}{\sum p_i^* q_i^*}$$

The size of the above ratio measures the *strain* within the system and reflects the magnitude of aggregate disequilibrium.

It can be assumed that the possible level of unemployment is related to the degree of *strain* in the system: the higher is *strain* (resource misallocation) the higher is the unemployment that would be brought about by the required resource reallocation. This is a major reason which lies behind the temptation to tolerate high inflation rates as a way to diffuse the tension within a system.

Are there any phenomena which can alleviate *strain*? Yes, and some of the most important are: inter-enterprise arrears, monopoly pricing, explicit and implicit subsidies, spillover effects, the elimination of negative value-added activities, *learning*, and last, but not least, the efficiency reserves of producers (who operate within their production possibilities curves themselves). In figure 1 A' denotes the action of the mentioned phenomena, whereas A" indicates the expansion of the production of (b) as well.

The more numerous are those who would lose their jobs because of the needed resource reallocation the more intense would be the opposition against it, against restructuring. Paradoxically, but not surprisingly, *strain* and, relatedly, the acutely felt need to reduce it, can induce a logic of motion of the system that is liable to perpetuate flaws of the old mode of resource allocation.

For the open economy there are several notable differences as compared to the closed economy model. The main one is the existence of comparative advantages which, supposedly, orient -- together with consumers'preferences -- the allocation of resources. A second major difference is that domestic prices reflect the open character of the economy -- the international exchanges. Since the economy is assumed to be a price-taker, world relative prices shape domestic relative prices. Another difference is that significant demand - and supply- related external shocks can lead to a compression (be it temporary) of the production possibilities curve. This compression amplifies both the reallocation problem and the related distributional struggle issue.

There are three phenomena specific to the open economy which can alleviate the *strain*

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in the system. One is the possibility to export *strain*. The recent years provide a remarkable case-study in this respect. Thus, after reunification, Germany exported *strain* to her neighbours, which led to the facto desmantling of the Exchange Rate Mechanism and other consequences. This possibility is more likely to be present the more active (and sizeable) is an economy in the world space, and the more it operates as a price-maker. Another phenomenon refers to how comparative advantages have to be viewed in a world of global sourcing and procurement. By this is meant the non-negligible chances for activities which, presumably, would have to be discarded. to be saved by their getting into a worldwide network of interconnected operations under the aegis of global companies. And finally, possible positive external shocks need to be taken into account.

The distributional conflict.

Another way of portraying *strain* is to focus on the scope of the required process of overall income (wages) readjustment which should fit the new market-clearing prices. Under market equilibrium conditions wages equal the marginal productivity of labor: $w_i = q'(n) = dq (n_i)/dn_i$. For the declining and substantially overstaffed sectors the equilibrium wage is fairly low -- even below zero for negative value-added activities. The reverse is the situation for the sectors enjoying comparative advantages, or for which domestic demand is very high.

The modified form of J' that builds on wages is:

$$(3) \qquad J' = \frac{\sum n_i |w_i^* - w_i|}{\sum n_i w_i}$$

where n denotes labor in sector (i), and w_i^* and w_i refer to equilibrium and actual wage, respectively, for the sector (i). $\sum n_i = N$, where N refers to all labor resources. For the inefficient, subsidized (explicitly, or implicitly) sectors actual wage exceeds the marginal productivity of labor: $w_i > dq /dn$. The higher is J', i.e., the higher is strain, the more fierce would be the distributional struggle.

The difference between equilibrium and actual wages reflects the resource transfer (subsidies) practiced by the system: the higher is this difference, the stronger will be the forces that oppose change. When the actual (subsidized) wage is significantly more attractive than the unemployment benefit and the labor market opportunities the resistance to quit job is heavy; therefore when:

$$(4) \qquad w_i + (w_i^* - w_i) > \varrho \gamma d + (1-\rho) w_j^e$$

where ($w_i^* - w_i$) measures the total subsidy, (ϱ) is the likelyhood of becoming unemployed, (d) is the unemployment benefit, $(\gamma)\varepsilon(0,1)$ is a coefficient that corrects the utility of the unemployment benefit by a *psychological cost*, and (1 -ρ) refers to the likelihood of finding a job in a viable sector (j).The psychological cost can help explain the permanence of what was previously seen as temporary unemployment - the **hysteresis** phenomenon.

For the post-command (transforming) systems, the *distributional struggle*, which is related to the required resource reallocation, appears as a structural origin of *strain* and as a structuralist-type explanation of inflation. Though it is aimed at the Latin-American experience mostly, Williamson's remark is quite relevant in this respect: "One can look beyond the Patinkinian vision

of the economy as a Walrasian system plus a money demand equation, and ask whether it may be necessary to incorporate one important idea in the postwar history of inflation theory...This idea is the notion of inflation as the result of inconsistent claims for real income shares" (1994, pp.68-69). He adds: "...stabilization is not only a matter of fiscal probity plus a nominal anchor plus credibility: it may also demand a choice between social confrontation and achievement of a social consensus" (Ibid., p.72).

It can be submitted that in the case of post-command economies the *distributional conflict* gets a dimension which goes beyond Williamson's meaning; this dimension is given by "the speed and, particularly, by the scope and magnitude of income redistribution entailed by the required resource reallocation". In the countries Williamson focuses on the distributional struggle takes place against the background of a pattern of income distribution which reflects a, relatively, stable allocation of resources. Therefore, individuals' expectations are relatively fulfilled. Differently, in the post-command economies a massive resource reallocation is underway, which affects considerably and brutally income distribution. Additionally, many individuals' expectations are profoundly unfulfilled. The frustration caused by unfulfilled expectations is magnified by exogenous shocks, which have led to a compression of production under circumstances when individuals are used to a certain pattern and level of consumption.

Strain is reduced by the underground economy. For example, can one believe that the current actual rate of unemployment in Spain is above 2o%, or one has to correct this figure with what is meant by the underground economy. In the same vein can be judged the functioning of this sector in the transforming economies.

2.2. From supply-constraints to tax-evasion

It can be submitted that the more regulated (and taxed) is an economy the more induced are agents to operate in the undeground sector. It can be also admitted that there exists an optimal *structure* and *level* of regulation of the economy which maximizes societal welfare; clearly, the optimal structure and level of regulation depend on social norms, values and principles which validate what people at large appreciate as being positive and, particularly, negative externalities.

Figure 4 tries to illustrate this optimality by dividing the economy into two sectors: the official and unofficial sectors which, both, consume factors of production (labor and capital). Point A, which signals the optimal composition of the economy, is tangent to the highest welfare curve, W. Both overregulation and underregulation lead to inferior compositions of the economy in terms of societal welfare. Thus, overregulation means an expansion of the underground economy against the background of reduced overall efficiency; in fig.4 the effect of overregulation is indicated by the lower welfare curve, W1, which goes through point B. Likewise, an underregulated system (as in the case of environmental protection) entails an "official" expansion of socially pernicious activities, which also reduces societal welfare; point C indicates this lower welfare level, W2. The shape of the combination curve indicates that both hyperregulation (as in a command system) and the lack of regulation (no rules) can lead to an implosion of the economy[14].
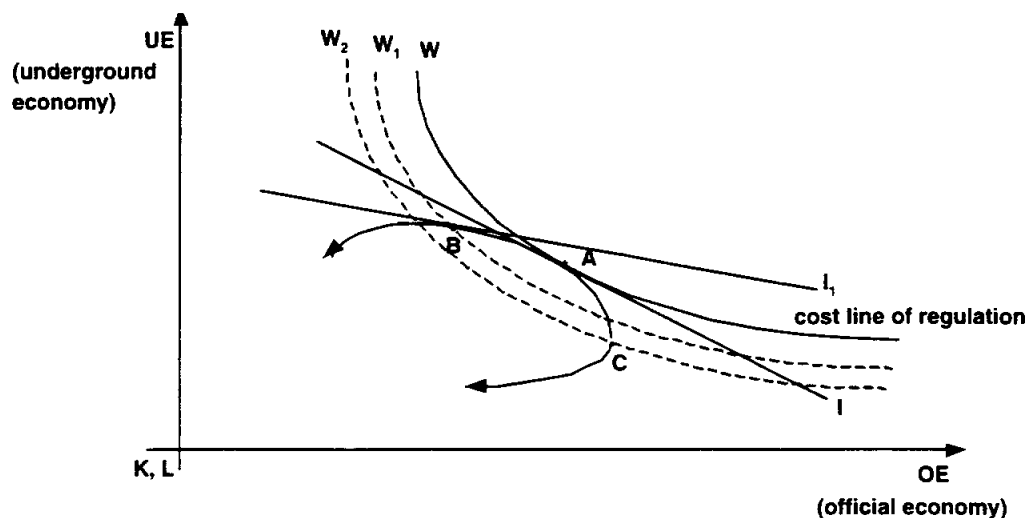
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Figure 4: Overregulation (taxation) and the distribution of activities between the official and the underground sector

When regulations (or taxes) rise (when the costline of regulations moves from I to I1) there is a shift of the price line in favor of the unofficial sector in the sense of stimulating its expansion --this happens because the goods produced in the official sector become more expensive. Another effect is an increase of the nominal prices of the goods and services in the underground economy --although they become relatively cheaper-- which can be only partially mitigated by its expansion (which puts downward pressure on prices in the unofficial economy)

Understanding micro-behaviors

In a simplified way agents' behaviours can be understood by comparing the benefits and costs of operating in the underground sector. The benefits are: the avoidance of the tax rate (t) and the cost of regulations compliance, (r). The cost is of non-compliance which means, inter alia, the penalty fee, (c), adjusted by the probability of being caught, (b).

A variable whose size is most critical is the cost of non-compliance, cb. The thesis of this paper is that when standards of reputation are low in a local environment the cost of non-compliance is diminished, which enhances the functioning of the unofficial sector. To this issue we will come back when the emphasis will be put on explaining reputation in a transforming economy.

What would be possible price dynamics in the underground sector? If p is the official market price, the mimimum price acceptable in the unofficial sector can be defined as:

$$p - (t+r) + cb = \min(p)$$

Clearly, the price mentioned above is the minimum for not incurring losses. The equilibrium price in the underground sector depends on the intensity of competition, which further depends on the cost of non-compliance. Thus:

- when (cb) goes up, the underground economy shrinks and viceversa; likewise, the equilibrium price,p*, rises

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- when the cost of non-compliance, cb, goes down the underground economy expands but, eventually p* goes down since competition intensifies.Figure 5 illustrates the operation of p* between the official market price and the minimum price.
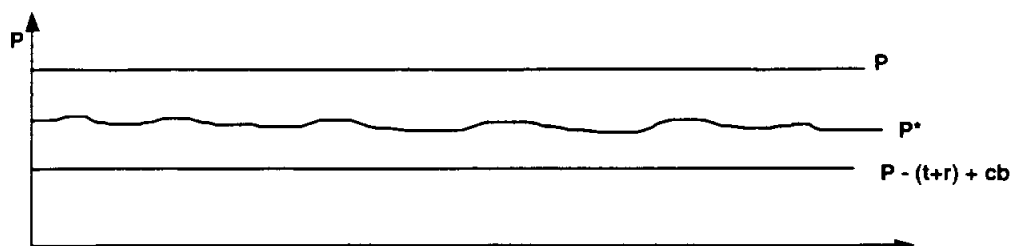

Figure 5: p* between the official market price and the minimum price

It can be submitted that severe competition in the official economy and a rise of the cost of non-compliance, cb, would tend to bring together the values of p, the minimum price, and p*. As it was emphasized the cost of non-compliance dependes essentially on the entrenched rules of the game in the local environment. To be more specific, the size of (b), which is the probability of being caught, depends on rule enforcements, social norms (D.North), and the local standards of reputation. It can also be assumed that the rules of the game depend on how agents (companies) view their reputation as an asset to be built up. This is why attention is focused next on the issue of reputation.

2.3 Reputation as an asset[15]

Why the choice is made for *reputation* bearing in mind that one can have thought about another intangible asset --such as *trust*, for example. It seems that this option can encapsulate conceptually pretty well what is the source of other intangible assets, be they *trust, truth-telling*, and *loyalty*. By accumulating reputation individuals and communities increase the amount of all other intangible assets. Likewise, widespread better reputation (in a good sense) necessarily implies less corruption, which is a ubiquitous feature of underdevelopment.

Let us say a few words about possible ways to introduce *reputation* in the economic analysis of development (Daianu, 1996). One has to think about it in both static and dynamical terms. Thus, it should be very appealing to common sense to view higher reputation (and, consequently, trust and loyalty) as a means to reduce X-inefficiency at both micro- and macro-levels, or as an addition to the stock of overall capital. This means that higher stocks of reputation can be captured analytically in two ways: either by increasing the stock of overall capital (capital augmenting) and, therefore, output; or by enhancing efficiency and. concomitantly, output. In the latter case one can easily resort to the concept of transaction costs (Oliver Williamson) and conclude that higher reputation as an average trait of a system reduces transaction and informations costs. This would be the static portion of analysis. Diagramatically, this can be shown by an outward shift of the production possibilities curve, or by coming nearer the frontiers of the PPC when X-inefficiency is reduced.

What about dynamics? In this case one can make an analogy with the role of human capital build-up, of education. in economic growth. Higher(more) *reputation* has several implications. Firstly. by making agents more efficient this is very likely to raise their propensity to accumulate

and invest over time. Secondly, higher reputation raises overall efficiency within the national environment and, thereby, it creates higher rates of return, which further may stimulate saving and investment. Summing up, one can dray an inference: higher reputation, seen as asset accumulation, is liable to make both individual agents and a national environment more efficient and competitive. On one hand, this shifts the production possibilities curve of economy outwards; on the other hand, it does raise the growth path of the economy.

Viewing *reputation* in transforming economies

As intangible goods *trust, truth-telling, loyalty* were very scarce commodities in the command economies. This legacy can not be overcome instantaneously in the transforming economies. The explanation for this state of affairs is essentially twofold: a/ institutional change is time-consuming, *natura non facit saltus*; and society, the structure of property rights are still to fuzzy in order to shape behaviors clearly and penalize misconducts. One can talk in this respect about a certain **ethos**, a business culture which reflects the quality of institutions; this business culture does not encourage high economic performances and does invite stagnation.

The shortage of ethical behavior is a facet of the lack of *reputation*. In a normal society, where good rules of behavior are the norm, reputation is highly valued; reputation can be built up, or destroyed, and this affects the evolution of individuals in society as well as their expected income streams. Normally, an individual who optimizes for the long run, would be much concerned about her reputation and would not undertake actions inimical to it[16]. This type of behavior is often neglected in transforming economies. There are several explanations in this respect. One, which was already alluded to, is linked with the fuzzy state of property rights. Another explanation can be connected with uncertainty, which reduces the time horizon used by individuals and organizations. These are, certainly, valid arguments. But what frequently motivates people is the attraction of easy to obtain high gains by speculating legal loopholes and by overlooking social consequences of their acts.

It should be borne in mind that such a behavior is not "rara avis", including political life. Usually, a politician should be much concerned about deeds which can harm her reputation. In transforming economies, one can often see politicians' beheviors much focused on the short term, which can hardly be rationalized by the pressure of current events; significantly more seems to be related to an optimization which involves the public position as a purveyor of *rents*. The public function is conceived as a good business, but not for a long time, and a *big discount is applied to reputation*. One could argue that this type of behavior fits those who enter politics for extra-political (economics) reasons. On the other hand, since this behavior is quite pervasive the resultant "competition" leads to increasingly bigger discounts. In this way society as a whole is a loser and the "state of law" becomes a long distanced image[17].

How could biased behavior in transforming economies be captured at a microlevel? A possile way is to use a utility function which includes *reputation* as a variable. The analytical exercise which follows has more heuristic than practical relevance and no computational implications are pursued.

The optimizing (satisficing) behavior implies the maximization of a function U below,

$$\max U = \max \int_0^T U_t(R_t,\dots) e^{-at} dt \tag{1}$$

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in which (U_t) is the utility stream, (R_t) refers to the stock of reputation at time t, (T) indicates the time horizon used by agents, and (a) is the discount applied the future utility flows. $T < T$, where the latter refers to the potential active life of an agent. Obviously, the assumption is that higher reputation (R) implies higher utility:

$$\partial U / \partial R > 0$$

The dynamic of the stock of *reputation* can be illustrated by the function:

$$R_t = R_0 \, e^{\, g(t)} \qquad (2)$$

where (R_0) denotes the initial moment, and g(t) is the function expressing the presumed evolution of the stock of reputation. In a normal enviroment, an agent would be interested in accumulating reputation and maximizing her utility function in the long run.

By (F) is indicated the degree of *fuzziness* (including property rights) in the system. A relationship can be established between (F) and the time horizon used by economic and political agents. It thus makes sense to assume that the higher is (F), ceteris paribus, the bigger is the propensity to reduce the time horizon, T. This means that:

$$T = T(F), \text{ when } dT/dF < 0 \qquad (3)$$

An interesting aspect can be brought into analysis, which may throw light on and explain why relatively low standards of reputation and high corruption are resilient in many areas of the world. This would also illuminate why people seem to accomodate their habits and condone what one may consider to be unacceptable patterns of behaviors and, presumably, likely to change over time. Thus, it can be submitted that, when it is seen in relative terms, *reputation* depends on local standards of ethics and morality (corruption); this assumption is more realistic when globalization of economic life, and of universally held standards of business ethics, has less of an impact. Therefore, a revised form of a reputation function, takes into account what is perceived as "normal" by the local environment. Thus,

$$R_i = R_i(R_l), \text{ when } dR_i/dR_l < 0 \qquad (4)$$

The above formulation intends to say that the degree of corruption in, or the moral (ethical) laxity in the system regarding the observance of normal (not local) standards of reputation affects the perception of agent (i)'s reputation. A state of affairs can be thought of when the spread of corruption is so wide and the interpretation of laws is so ununiform that agents become indifferent to *reputation* as an asset[18]. Under such circumstances the growth rate of reputation. r. becomes insignificant, or even negative; it is the case of sacrificing any trace of reputation for the sake of realizing exceptionally high material gains in the short run. In this case the trade-off between *reputation* and other factors which enter into the utility function does not favor the build up of reputation.

When short-term materials gains get the upperhand vis-a-vis the accumulation of reputation one can complicate the optimization process. Thus, te optimal stock of reputation can be seen as being dependent on the local rules of the game, and the specific "weight" of the agent. In this case the utility function (1) is revised by making a distinction between reputation, R, as a goal in itself, and M(R) which denotes potential material gains to be made by using the "rules of the game" and the knowledge of the local environment (inside information). The relationship (1)

turns into,

$$\max U = \max \int_0^T U_t \, (R_t, \, M(R), \ldots) \, e^{-at} dt \tag{5}$$

with M'(R)>0 and M''(R)<0.

Under sufficiently constraining conditions of the local "rules of the game", or by very small incremental gains which induce agents not to care about reputation, a situation can be imagined when higher (R) is not accompanied by higher M(R) -- dM/dR<0; it is like a point exists from which the marginal cost of "puritanical" behavior exceeds its marginal benefit (Fig.5). This means that material gains pravail over the accumulation of reputation.
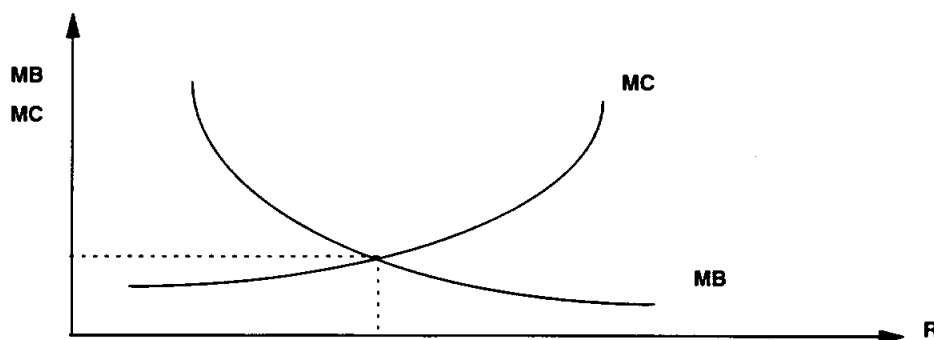

Fig. 6: Optimal *reputation*

Why the specific "weight" of actors is mentioned? For there are people, who, through their "critical mass" (including reputation) can influence the rules of the game and the environment. For such individuals, whose dimension goes beyond the frontiers of the local environment, *reputation* acquires different parameters of definition and possible compromises they may get into have a different nature and other implications. Such individuals may develop the ability to lack "flexibility" and not be forced to "howl with the wolves"[19].

There are cases when highly reputed individuals once taking over public positions, can improve the image of the public entity (the country) they represent. This can be the situation of a minister of finance, or of a governor of a central bank. Obviously, this reasoning can be extrapolated to a whole government. For such circumstances a collective utility function includes as a variable the reputation of key public servants (ministers).

A few words concerning the discount rate (a): the latter depends also on the degree of uncertainty regarding the evolution of the legal environment. The less clear and more uncertain is this environment as against an ideal framework the lower is (a).

An aspect needs to be stressed again. The initial drop of the output of tangible goods, which may be quite persistent, can strain social relations and diminish, considerably, the significance of the substitution relationship --both in consumption and production. Since the new norms are not rooted socially well enough and since a new moral order can not emerge instantaneosly the role of "moral models" acquires exceptional importance. Leaders of great charisma and moral probity, with vision and determination are essential in making operational the mentioned substitutions. *Leadership* as an issue underlines the moral dimension of transformation.

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Ultimately, however, solid institutions have to come into being in order to make societies perform.

3. A global model based on the labour supply method

The national economy is considered as having two sectors: a visible (or official) sector and an invisible (or underground) sector. For the visible sector the registered GDP has the following components:

$$Yv = A + Sv + Bv \qquad (1)$$

where Yv is the GDP produced in the visible sector; A - consumption of fixed capital (only in the visible sector); Sv - wages of employees in the visible sector; Bv - profit of entrepreneurs (capitalists) in the visible sector. In the invisible sector the produced GDP will be:

$$Ya = Sa + Ba \qquad (2)$$

where Ya is the GDP produced in the underground sector; Sa - wages of employees in the invisible sector; Ba - profit of entrepreneurs (capitalists) in the invisible sector. In the invisible sector it is supposed that there is only circulating capital.

Also, the available time fund and the total number of labour force is distributed between two components, as follows:

$$F = Fv + Fa \qquad (3)$$

$$L = Lv + La \qquad (4)$$

where F is the total available time fund for work within a calendar year; L - number of total potential working persons; Fv - time used for work in the visible sector by year; Fa - potential available time used by the persons having status of employees in the visible sector for work as a double job in the underground sector; Lv - number of employees working in the visible sector; La - potential number of employees working in underground sector.

The available working time is taken as the as average number of hours' values by a calendar year. For instance, they may consider as average number of hours worked by a person within a calendar year.

Now, the GDP created in the two sectors of a national economy is expressed as functions of productivity, which appear as linear functions:

$$Yv = Lv \cdot Fv \cdot wv \qquad (5)$$

$$Ya = (La \cdot F + Lv \cdot Fa) \cdot wa \qquad (6)$$

where wv and wa are the average productivity per person per hour in the visible sector and, respectively, in the invisible sector.

To obtain the total number of hours worked in a year in the underground sector two categories are considered. One of this inludes persons that work full-time in the underground sector (persons having status of non-employees in the visible sector) ($La \cdot F$). The other regards the persons

having the status of employees in the visible sector, but working also in the underground sector during the supplementary work time as a second job (Lv · Fa).

What is interesting for the agents or people is the level of disposable income or available GDP. In the two sectors of the economy the available income or GDP is given by the following relations:

$$Ydv = Yv - T = Yv \cdot (1 - t) \tag{7}$$

and respectively

$$Yda = Ya \tag{8}$$

which can be also written under the following forms:

$$Ydv = Lv \cdot Fv \cdot wv \cdot (1 - t) \tag{9}$$

$$Yda = (Lv \cdot Fa + La \cdot F) \cdot wa \tag{10}$$

where Ydv, Yda represent the available income in the visible sector and respectively in the invisible sector; T is the total amount of taxes paid (or of obligatory levying); t - average tax rate relatively to Yv.

Taking into account the structural relations (9) and (1o) we can write now the expression of the total available income as follows:

$$Yd = Lv \cdot Fv \cdot wv \cdot (1 - t) + [Lv \cdot (F - Fv) + (L - Lv) \cdot F] \cdot wa \tag{11}$$

or

$$Yd = (L - La) \cdot (F - Fa) \cdot wv \cdot (1 - t) + [(L - La) \cdot Fa + La \cdot F] \cdot wa \tag{12}$$

The first relation permits to analyse the impact of the number of persons working in visible sector (Lv) and of their corresponding number of hours worked in this sector (Fv) on the total available income at national level. The second makes the same but concerns the number of persons working in the invisible sector (La) and respectively the number of hours worked in the invisible sector by persons having the status of employees in the visible sector (Fa). We remember that in the case of persons actually having the status of non-employees in the visible sector (but having a potential to work by age and disposable free time criteria) it is supposed that they allocate their entire available working time to work in the invisible sector (F). At the same time, the persons actually having the status of employees in the visible sector are forced to divide the same entire disposable working time (F) between the work in the visible sector (Fv) and work in the invisible sector (Fa).

This total available income, greater than the available income in the visible sector, is responsible for some unexplainable macroeconomic non-correlation registered between some "official" indicators.

What is defined as the yearly national potential is given by the following relation:

$$P = F \cdot L \cdot wv \tag{13}$$

where P is the maximum level of annual GDP.

Since to the productivity in the invisible sector is supposed to be lower than productivity in the visible sector it results the following non-equality:

$$Yv + Ya < P \qquad (14)$$

The actual total available income per year is:

$$Yd = P \cdot [m + lv \cdot fv \cdot (1 - t - m)] \qquad (15)$$

where m is the ratio between the productivity in the invisible sector and the productivity in the invisible sector (wa / wv); lv - the share of employees in the visible sector in the total number of potential working persons (Lv/L); fv - the share of time used to work in the visible sector in the total available working time within a calendar year (Fv/F). On the other hand, if the entire activity were in the visible sector the maximum level of available GDP would be:

$$Yd^* = P \cdot (1 - t) \qquad (16)$$

Now, it is supposed that the people chose the actual situation, that is the actual distribution of the total capacity to work between sectors. This produces an available income greater than or at least equal to that would be produced by the above hypothetical case. Therefore, there will be the following restriction:

$$Yd > Yd^* \qquad (17)$$

After some technical algebraic operations the following equivalent restrictions are obtained:

$$m > 1 - t \qquad (18)$$

$$wa > wv \cdot (1 - t) \qquad (19)$$

It should be mentioned that the present model, as a simulation model, tries to determine the variance interval thresholds of the underground sector on the basis of the existing statistical data at macroeconomic level. In this case are considered the absolute values both for the total potential number of working persons (L) and for the total number of potential working hours during a calendar year (F). This could seem a exaggerated comparied with the real values registered in the case of the visible sector (Lv and Fv).

In the invisible sector, the levels of some indicators - productivity, profit rate - are considered smaller than, presumably, is the case in reality. This is partly because of the leisure component. For instance, the actual available income computed by our simulation model is greater than the level that would obtain in the case of a full-time work in the visible sector (Yd > Yd*). The difference must consider as implicitly including the satisfaction of the leisure comprehension problem.

Now, it is important to evaluate the variation interval of the underground sector dimension. In this way the share of the invisible sector in the national economy appears as:

$$ya (wa) = Ya (wa) / Y (wa) \tag{20}$$

where Ya (wa) is given by the relation (23) and Y is the total yearly GDP:

$$Y (wa) = Yv + Ya (wa) \tag{21}$$

For the productivity in the invisible sector the following extreme values are chosen:

$$wa_{min} = (1 - t)\cdot wv \tag{22}$$

$$wa_{max} = wv \tag{23}$$

to which correspond the following extreme values of the share of the invisible sector in the national economy:

$$ya_{min} = 1 - \{(lv \cdot fv) / [1 - t \cdot (1 - lv \cdot fv)] \} \tag{24}$$

$$ya_{max} = 1 - lv \cdot fv \tag{25}$$

Within this interval are analysed diverse alternatives regarding the average wages and profits in the underground sector relating to the situation registered in the visible sector.

In the visible sector, in order to evaluate the average wage and the average rate of profit, the following relations:
are posited:

$$sv = [Sv / (Lv \cdot Fv)] = [Yv - (T + Bv + A)] / (Lv \cdot Fv) \tag{26}$$

$$bv = [Bv / (T + A + Sv)] = [Yv - (T + Sv + A)] / (T + A + Sv) \tag{27}$$

where sv is the average wage per person per hour of work in the visible sector; bv - the average profit rate in the visible sector; Sv - the total amount of the yearly salaries in visible sector; Bv - total amount of the yearly profits in visible sector.

On the other hand, in the invisible sector the corresponding relations are:

$$sa = [Sa / (La \cdot F + Lv \cdot Fa)] = (Ya - Ba) / (La \cdot F + Lv \cdot Fa) \tag{28}$$

$$ba = [Ba / Sa] = (Ya - Sa) / Sa = (wa - sa) / sa \tag{29}$$

where sa is the average wage per person per hour of work in the invisible sector; ba - the average profit rate in the invisible sector; Sa - total amount of the yearly salaries in invisible sector; Ba - total amount of the yearly profits in the invisible sector.

In the applications the consumption of fixed capital (A) is replaced by investment. Moreover the average wage in the invisible sector is considered comprised between the values 0.5 and 2 relating to the average wage in the visible sector of the national economy. Here are presented some conclusions resulting from the application of the model to Romania's economy.

For each year of the period 1989-1993 the number of employees in the visible sector (Yv) is

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that from the available official statistical publications. To evaluate the yearly time of work in the visible sector for each year the number of days of the year was diminished by weekend days and vacancies. Then the result was multiplied by the legal time working per day (8 hours) and then by an average coefficient that designs the average using degree of the total legal working time.

For both the total potential numbers of employees (L) and total number of hours per year per person (F) were considered three versions designated as maximum (I), intermediary (II), and minimum (III). In the maximal version, L includes the employees in the visible sector (Lv), official unemployed, school population of age over 15 years, and retired population of age under 70 years. In the intermediary version, it added to Lv the same number as in precedent case, but divided by two. In the minimal version, it added to Lv only a half of unemployment number.

In the case of F, the maximal version was obtained by multiplying the calendar year number of days by eight (representing hours of work by day). To determine the intermediate value of F, 52 (representing the number of Saturdays per year) was added to the average number of days worked per year by a person in the visible sector (Fv). Moreover, a half of the number of days used for vacancies in the visible sector was added. Then the result was multiplied by eight (the number of hours worked dayly). In the minimal version the same number of days worked in the visible sector was chosen, and was multiplied by eight hours per day.

In the case of each variant (I, II, and III) two threshold values - minimum and maximum - of the underground economy were calculated by using formulas (32) and (33). Also, within this interval, a sub-interval was separated. This sub-interval covers, on the one hand, the intersection between the curve of salary in underground sector and the value of salary in the official sector (inferior limit). On the other hand, it covers the intersection between the curve of profit rate in the underground sector and the value of profit rate in the official sector (superior limit). This sub-interval represents, when it adopted one of the three variants for analysis, the set comprising the most probable values of the underground economy share. A synthetic presentation of simulation results there is in the following table. Figure 7 shows the dynamics of underground economy in Romania in the period 1989-1993, according to the three variants.

Variant I, derived from the theoretical limits of the productive national potential, can suggest the maximal values to which the underground sector could extend. It is useful for long run forecasts. Variant III produces estimates that are near the figures commonly used to gauge the size of the underground sector in the Romanian economy. One of the most difficult problem remains the separation between the preference of people to use their available time for work in the underground economy and that to use the available time for leisure. In any case, variant I can produce a satisfactory estimation for the total available time (including both components).

Final remarks

The underground sector can be seen as a homeostatic device (mechanism) of an economy under *strain*. The latter, as a phenomenon, is caused either by the rules of the game --as in the command economy-- or by dramatic changes in the parameters defining the functioning of an environment. Moreover, strain is enhanced by institutional fragility.

Whereas the underground sector is an outstanding structural feature of the command system (as a hyperregulated entity which ignores consumers' and producers' preferences) it continues to exist in market economies as well. For, as this paper argues, no real economy can escape *strain*. The issue, therefore, is the intensity of *strain* and its malign effects on the economy. An implication would be the need for policy-making to consider strain at both micro- and macro-levels. Reengineering enterprises and reforming economies can be scrutinized from this

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perspective.

Subjected to dramatic changes in relative prices, transforming economies --as market economies in the making-- can not be but under much *strain*. It is no suprise that the transforming economies evince substantial underground sectors. As it is our contention, the exceptional magnitude of the required resource reallocation and the fragility of the new institutions (the *softness* of formal rules) stimulate the "development" of hidden sectors.

The globalization of trade and financial markets, as well as the "new information age" speed up the process of required change and add additional pressures on the transforming economies.

The formal model and the empirical analysis applied herein to the Romanian economy helps gauging the potential size of the underground sector. It should be said that the fuzziness of property rights changes some of the assumptions of the models regarding the presumed relative productivities in the two sectors of the economy; this fact, however, does not invalidate the main results of the model.

Variant I:

Year$_t$ =	Iyamin$_t$:=	Iyamax$_t$ =	Iya_sa$_t$:=	Iya_ba$_t$:=
1989	35.8	51.3	44.6	50.8
1990	48.4	59.4	54.5	56.8
1991	57.2	67.3	62.8	65.8
1992	62.3	71.3	67.5	69.4
1993	64.8	71.8	68.7	70.4

Variant II:

Year$_t$ =	IIyamin$_t$ =	IIyamax$_t$ =	IIya_sa$_t$ =	IIya_ba$_t$ =
1989	24.8	38.4	32.3	37.9
1990	33.3	43.7	38.9	41.2
1991	41.7	52.4	47.6	50.6
1992	47.4	57.6	53.0	55.4
1993	49.6	57.7	54.0	56.0

Variant III:

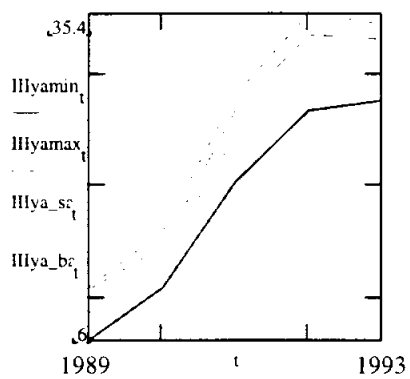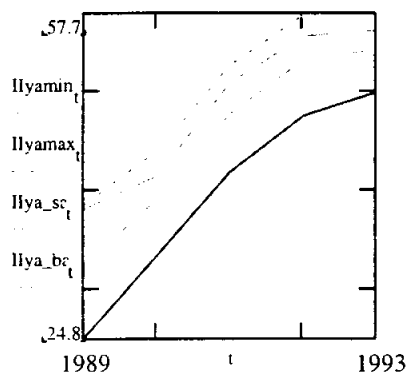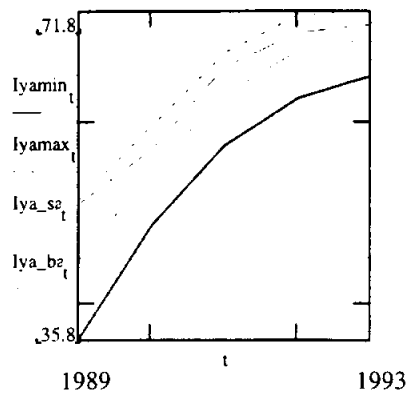| Year$_t$ =	IIIyamin$_t$ =	IIIyamax$_t$ =	IIIya_sa$_t$ =	IIIya_ba$_t$ =
1989	6.0	10.8	8.5	10.6
1990	10.7	15.8	13.3	14.4
1991	20.1	28.0	24.3	26.6
1992	26.7	35.4	31.3	33.4
1993	27.6	34.6	31.3	33.1

Variant I:

Variant II:

Variant III:

Figure 7

NOTES

1. Paper presented at the conference "The Importance of the Underground Economy in Economic Transition", Zagreb, 15-17 May, 1997. Many thanks to Ivo Bicanic, Roger Bowles, Krassen Stanchev, John Tedstrom, and particularly Edgar Feige, for their useful comments. It goes without saying that the authors bear sole responsability for the content of the paper.

2. The authors are Chief Economist at the National Bank of Romania and Research Fellow at the Institute of Economic Forecasting, respectively; they bear sole responsability for the views expressed herein.

3. R. Hoch (1981) and, particularly, K.A. Soos (1985) are among those who pointed out that the *structural inelasticity of supply*, as a phenomenon, does not derive solely from chronic shortage.

4. Besides J. Kornai etc. outstanding contributions to analytical investigation of *the structural constraint of supply (chronic shortage)* were made by M. Kalecki, J. Goldmann and K. Kouba, Fr. Holzman, H. Levine, V. V. Novozhilov etc. This research was also enriched by the studies of T. Bauer, J Beksiak, J. Burkett, S. Gomulka, D. Kemme, R. Portes, K.A. Soos, J. Winiecki, etc. I. Kritsman (1925, 1929) seems to be the first to have spoken of "general shortage" in an economy.

5. (φ) can be viewed as a factor that diminishes the real wage (W/P), taking into account the energy and time deployed for procuring the goods in short supply.

6. How important (Φ) is can also be seen from a remarkable paper of I. Lemnij (1984), who highlights *variety* as a collective use value of commodities.

7. The analysis can consider separately the effect on the effort in production and on labor supply. Thus J. Brada and A. King, (1986) use a formal macroeconomic model of a centrally planned economy in order to determine the degree of "plan tautness" which maximizes output when both the supply of effort and the supply of labor are influenced by "plan tautness". Differently, L. Podkaminer tries to explain investment cycles in centrally planned economies by invoking consumer markets disequilibrium and labor shortage (1985).

8. With regard to the "informational noise" in supply-constrained economies see also N. Spulber, I. Horowitz (1976, chapter 2), and R. K. Sah, J. Stiglitz (1986).

9. For a manysided discussion of this phenomenon in centrally planned economies see G. Grossman (1981). See also M. Wisniewski (1985) and P. Galasi, G. Kertesi (1985).

10. In a supply-constrained economy the underground economy operates in conjunction with central decision-making bodies to create the economy's system of regulation ("through

shortage").

11. Here it is considered a highest societal indifference curve when consumers (markets) decide on the composition of output. In the sense of the Lange-Lerner model the State is an agent that influences this composition through the rate of investment (rate of interest), taxation, etc.

12. The expression would basically be the same for an open economy, that faces an external demand constraint, especially if the longer run is considered.

13. Investment cycles can be provoked by policy actions, that respond to extreme inbalances in consumer goods markets (J. Winiecki (1982), H. Olivera (1960), L. Podkamminer (1985, etc.), or to supply tensions (J. Goldmann and K. Kouba (1967), T. Bauer (1978), etc).

14. We owe this observation to Edgar Feige.

15. For various ways of dealing with reputation in formal models see the book edited by Daniel B. Klein (1997), particularly part three.

16. The dynamic of the accumulation of reputation is analogous to human capital build up, in the spirit of the models used by Gary Becker and Th. Schultz.

17. A fallacy of composition is involved here; what seems to be rational for individuals becomes detrimental for society. A negative externality thus emerges.

18. One can imagine situations of equilibria --good or bad-- related to individuals' behaviors. An example is when people pay their due taxes, or they evade it. There are models which try to portray such situations. Thus, it is assumed that the production of an individual firm is an increasing function of the public good provided by the state; the production function can be written as $(q_i=q+ag)$ when taxes are paid, and $qi=q$ for the case of tax evasion. It is assumed now that the level of public good (g) is given by (nt), where (t) indicates the degree of fiscality, and (n) denotes the number of firms that pay taxes. Different equilibria appear. Let us assume that $a<1<N$. The income after tax of the firm is $(q+ag-t)$ if the firm pays taxes and (q) if the firm does not pay taxes. It seems that the decision is clear for the firm; it tries to avoid taxes as long as $t>ag=ant$, or $n<1/a$. If $n=1$ (which means that all firms practice tax evasion) the firm N is also stimulated to get into tax evasion since $n<1/a$ (aacording to the assumption made). If $n=N$, then the firm is interested in paying taxes since $n>1$ (see also J. Sachs, 1994, p.48). This reasoning can be applied to any kind of criminal, or illegal act.

19. Once, a banker confessed to one of the authors that the world of business "does not like those who are more catholic than the Pope". This would mean that one needs to be particularly heavyweight in order to be successful as a businessman while being "excessively puritanical" in behavior.

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