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Asymmetric Information and its Relation with the Type of Equilibrium in the Planned Economy

Abstract.
In characterizing the planned economy, a number of researchers (e.g. Walter Eucken, János Kornai, Tamás Bauer) pointed to such features of this system, which we can analyse in the terms of asymmetric information. As examples it makes sense to consider the following features: the centralized distribution of resources and, as the result, the lack of choice (and information) among enterprises when they acquire resources; the chronic goods shortage when the buyer does not know where he/she can buy something; the macro level decision makers do not posses complete information about the micro level, so the heads of (state-owned) enterprises can hide (from the planners) the their real situation to attract new projects and state investments. The paper draws parallels between the market with asymmetric information in the model of George Akerlof and the centrally planned economy. The asymmetric arrangement of the demand and supply curves for characterizing such a market is supposed. So the paper elaborates the hypothesis about the asymmetric arrangement of the curves of aggregate demand and supply to characterize the deformed structure of the planned economy. In the paper, the market equilibrium is not treated as the point of intersection of the curves of demand and supply but it is related with the type of the prices distribution. Based on this assumption, the attempt to compare the hypothesis about the asymmetric slope of the S-D curves with the János Kornai's theory of the soft budget constraint is made.

Key words: centrally planned economy, asymmetric information, the curves of demand and supply, asymmetric equilibrium, price dispersion, soft budget constraint

JEL: D2, D4, D5, D82, E3, P10, P20, P50

1. Introduction

Somebody can think that the centrally planned economy (CPE) is already a part of the historical past and represents an interest only from such a historical point of view. However, first, the surviving islands of socialism (using the words of J. Kornai) we can still observe in the post socialist countries and even in the countries with developed market economy as well. Second, the socialism (or communism) is a strong sentiment related with idealistic expectations that can return or appear even on the orthodoxically capitalistic ground. And, third, the analysis of the centrally planned economy gives us a rich material for elaborating such important issues of economics as institutional analysis, economic equilibrium and macroeconomic stability, asymmetric information, evolutionary economics, etc.

One of the important characteristics of the CPE that can be also the characteristics of some phenomena in the (so called) market economy is asymmetric information between producers (sellers) and consumers. In the paper, the problem of asymmetric information is regarded in its relation with the problem of economic equilibrium, i.e. it is asserted that the market with asymmetric information should be characterised by asymmetric arrangement of the curves of supply

and demand. In its turn, such an assertion-hypothesis is connected with the two other hypotheses. One of them says that the curves of supply and demand describe a set of prices, and we must judge about a market equilibrium on the basis of this set; I call it a dispersion-probabilistic approach. So the asymmetric arrangement of the curves of supply and demand corresponds to asymmetry in a prices distribution that characterizes a relevant market. And another hypothesis says that such an asymmetric arrangement of the curves of supply and demand must describe the macroeconomic equilibrium, i.e. the interrelationship between aggregate demand and aggregate supply for the centrally planned economy.

In the paper, besides a short description of these three hypotheses (see also Voznaya, Geyets, 1998; Voznaya 2005) I also attempt to consider the János Kornai's theory of the soft budget constraint in the light of the expressed hypotheses and propose some new conjectures.

2. The first hypothesis: Market equilibrium is something more than a point

Traditionally, in modern economics the market equilibrium between supply and demand is represented by corresponding curves. The demand curve is the graph depicting the inverse relationship between the price of a certain commodity and the amount of it that consumers are willing and able to purchase at that given price. Analogically the supply curve represents the direct relationship, which must exist in competitive markets, between the price of a certain commodity and the amount of it that sellers are willing and able to offer. The point of intersection of these curves defines the equilibrium price (the price at which sellers together are willing to sell the same amount as buyers together are willing to buy) and the equilibrium quantity (the amount of that good or service that will be produced and bought without surplus/excess supply or shortage/excess demand) of that market.

This approach to the estimation of market equilibrium originates from neoclassical conceptions, especially from the theory of Alfred Marshall, which connected slopes of demand and supply curves with the law of diminishing marginal utility and the law of increasing marginal costs, respectively. Despite its popularity in modern economics, opponents of neoclassical economics have criticized such a definition of market equilibrium, first of all for the exaggerated role of rationalism in the attempt to explain economic behaviour and a simplification of economic reality (see, e.g., Sraffa, 1926, p. 535).

When two parties dispute, the truth encompasses both. Like the neoclassical tradition I would like to use the curves of demand and supply. But in contrast, here I prefer to regard a market equilibrium not as a dead point of equilibrium but as a price dispersion of a definite type.

In my opinion, the curve of demand describes not only the dependence where a definite quantity of demand corresponds to the single price. It is evident that a consumer agrees to buy a certain commodity on the level "q_1" at the price not exceeding the level "p_1". Therefore we can suppose that a score "p_1", corresponding to "q_1" in *Figure 1*, is the limit of a certain prices set, while the demand graph represents the upper frontier of the cloud of consumers' price preferences. That is, if the curve of demand as a function may be defined by a formula:

$$D = Fd(p),$$

The set of consumers' price preferences may be defined as the antiderivative of the demand function:

$$Q_d = \int Fd(p)dp.$$

We may apply an analogical principle in relation to the supply curve. We can suppose that the sphere of sellers' prices preferences, including the supply curve, also contains some space over it. So we may regard the supply curve as a bottom frontier of the cloud of sellers' price preferences and define this by a formula:

$$Q_s = \int Fs(p)dp.$$

The intersection of these two sets of prices preferences reflects not only the equilibrium point as the curves of supply and demand do, but also the price dispersion (this variation is marked by

hatching in *Figure 1*). Here, the demand curve describes the upper frontier of the buyers' price preferences, and the supply curve describes the lower frontier of the sellers' price preferences. So we deal with price dispersion where the equilibrium price "p_e" reflects the most frequent (modal) price level (*Figure 1*). Normal Gaussian distribution likely depicts the ideal situation. But the more elastic position of demand and supply curves, the less price variation outlined by these curves is.

Figure 1. *Market equilibrium and price dispersion*
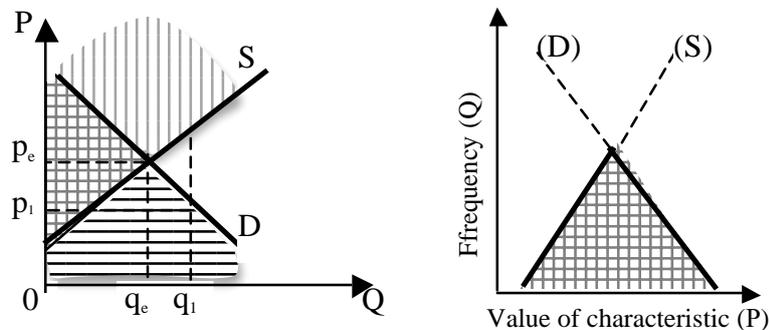
Source: (Voznaya, 2005).

This approach is more realistic because it deals with not only (equilibrium) price, but with a price dispersion, which actually characterizes markets. Based on the type of price distribution, combined with the slopes of supply and demand curves, we can better understand whether a certain market system is characterized by equilibrium, disequilibrium, stable or unstable (fluctuating) equilibrium.

3. The second hypothesis: The market with asymmetric information as a market with asymmetric type of equilibrium

G.A. Akerlof in his prominent work (Akerlof, 1970) examined the problem of asymmetric information on the example of the used car market. This market can offer both relatively good quality cars in fine condition and bad used cars ("lemons"). Still, buyers cannot, on their own, determine whether a given car that they are interested in is actually good or bad as they are unable to check out a slew of important mechanical features. Thus, without actually having sufficient information about the real state of any given car, buyers will pay only a mid-range price for it, that is, the price of a car of known average quality. For instance, if a good quality used car is worth $8,000, while a lemon is essentially worthless, buyers will be willing to pay only $4,000, even if a particular car is actually of good quality. Gradually, owners of good cars leave the market because they are unable to get a fair price for the value of their cars. As sellers of better-quality cars leave the market, the average quality of used cars goes down and, along with it, the average price. This further drives out owners of relatively good cars. This process of poorer and cheaper cars pushing out relatively better and more expensive cars repeats itself until all that is left on the market is lemons and the market itself ceases to operate. In other words, a market with asymmetric information eventually collapses.

Analysing the model of Akerlof we can make at least the three principal conclusions (or assumptions) about the market with asymmetric information. First, the main property of the markets with asymmetric information is the fact that buyers and sellers are not equally informed about the qualities (main characteristics) of the goods offered on the market. For example, the sellers own the more reliable information about their products than the buyers of these goods. Second, such a market can be characterized by adverse selection. Third, an asymmetric information can be related with instability of a market state. And, besides, we can suppose the fourth feature, namely the asymmetric arrangement of the supply and demand curves for the characteristics of such a market.

Based on the equations applied by Akerlof, his theory looks at classical, that is, symmetric positioning of supply and demand curves in which supply is directly related to prices, while demand is inversely related. Nevertheless, in my opinion, in the case of the market of lemons discussed earlier, we actually have an asymmetric position of supply and demand curves: demand demonstrates here a non-standard relationship to prices. If, according to Akerlof's equations, demand for used cars depends on both price and quality but since the latter directly affects prices, demand in this model effectively moves in the same direction as prices. This direct dependence of demand on prices makes the used car similar to Giffen goods, demand for which also changes in the same direction as prices. Although the reasons behind such a dependence on prices are different in these two instances, it is an interesting coincidence that a used car i.e. a lemon, like Giffen goods, should be placed in the group of inferior goods.

In the specific example provided by Akerlof, the thesis that supply and demand curves are asymmetrically positioned, can be supported by the application of a cobweb model. For instance, when supply and demand curves both slope up to the right but equilibrium is unstable, the "path" of the cobweb moves further and further from the equilibrium point and effectively coincides with the direction in which the used car market collapses (see Fig. 2). In Figure 2, we can see that when sellers want to sell a certain quantity q_1 of a given good at a price p_1, buyers will agree to buy this quantity but for the lower price, p_2. If the price falls to p_2, then supply will also go down, to q_2. Buyers will again not be satisfied with the established price and will "promise" to buy the given quantity of products q_2 at the even lower price, p_3. But the repeated reduction in the price to p_3 will also reduce supply to the level q_3. This process repeats itself until the market has only goods with no value and trading stops altogether.

Figure 2 . Asymmetric equilibrium for the market of "lemons": the cobweb model
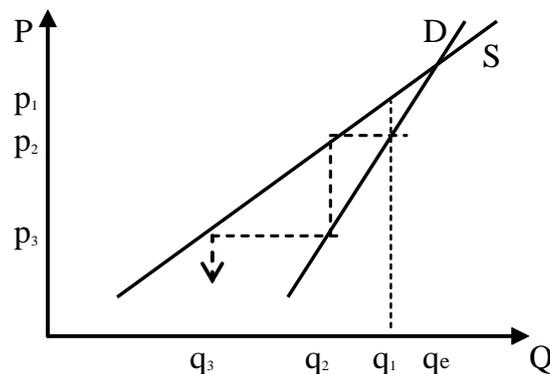
If this thesis is correct, we can suppose that the market with asymmetric information is characterized by such a level of information imperfection that it (a market) should be described by asymmetric type of equilibrium, i.e. asymmetric arrangement of the curves of supply and demand for characteristics of this market.

4. The signs of a market with asymmetric information in the centrally planned economy (CPE)

Since the perfect information is theoretically an attribute of the market with perfect competition (the one pole), it is logical to suppose that the system on the opposite pole, with oppressed competition, namely the centrally planned economy is a system with a so high level of information imperfection that the latter must be characterised as asymmetric.

In the Soviet economy, the information asymmetry between buyers and sellers consisted primarily in the unfavourable i.e. subordinate position of the buyers (consumers) in relation to the sellers. Firs, the distribution system of CPE meant the acquisition by enterprises of resources on the principle of "a cat in a poke", i.e. a complete lack of choice; so sometimes producers acquired the substandard, even completely useless means of production. In general, as Walter Eucken wrote, in

CPE the consumers' needs are determined by the same economic bodies that also control the production process (Eucken, 1995, p. 156), i.e. the demand as a whole was being adapted to the supply, and not vice versa.

Not only enterprises but also the final consumers (householders) suffered from the chronic shortage and dealt with asymmetric information on the consumer market. In particular, J. Kornai in his description of the shortage economy, regarded the case of such an asymmetry when the buyer does not know where he/she can buy something (Kotosz, 2014); also, he points out to the state health sector as a 'surviving island of socialism's shortage economy' in modern Hungary, and gives a good example of such a lack of consumer's choice, when writing:

Forced substitution occurs on a mass scale: patients are not seen by a chosen doctor or treated in the hospital they would wish; they are prescribed cheaper medicines than their accustomed, preferred ones. Patients, in any case in a defenceless position, are still more defenceless in a shortage economy, where the supply side is stronger than the demand side. (Kornai, 2012, p. 375)

Furthermore, in the CPEs the asymmetry concerning the decision-making process (by the central planning bodies) was observed, inasmuch as the planners at the upper level of regulation owned insufficient information about the specific state of affairs at the enterprise level. An example of this type of asymmetry was actually considered in the late 1970s and early 1980s by the Hungarian economist Tamás Bauer in his theory of the investment cycle in CPE. In particular, Bauer focused on the inability of "planners" to control the investment process. The key idea of his concept is the "investment hunger" and insatiable need for investment that took place at all levels of decision-making in the CPE. Not only the "planners" tried to increase the share of accumulation in order to increase the production growth rates: in order to increase their prestige and power, enterprise managers were also constantly striving for expansion through a new construction.

The concept of "investment hunger" means that the increasing demand for investment resources is always opposed by the limited capacity of the investment complex. In CPE, the presence of the "investment hunger" at all decision-making levels made it difficult to monitor the adoption of investment projects. The problem was exacerbated by the tendency of enterprise managers to understate the funds necessary for the implementation of investment projects; i.e. since the managers of investment projects tried to "catch on a plan", they depicted the expenses necessary in the future as modest. In the end, this led to the situation when the initially approved estimate of the objects under construction with time turns out to be significantly less than the real need for investment resources of all interconnected links.

Bauer identified the four phases of the investment cycle in the CPE. At the first stage, the planning office approves a large number of investment projects. Initially, their cost seems relatively moderate, but the aggregate demand for capital investments is growing rapidly. In the second phase, the new projects are still being accepted, but the projects adopted in the first phase already generate concern about too high costs of their implementation. The demand for products and services of the investment sector is becoming excessive. This leads to the increase in the accumulation share in national income, which is accompanied by a reduction in the growth of consumption or exports. In the third phase of the cycle, new projects are no longer accepted. The work on the existing objects, is being carried at an accelerated pace in order to reduce the amount of work in progress. The shortages in the investment sector are intensifying. When the fourth phase of the cycle begins, not only the spending on new facilities is cut, but also the spending on the already started objects begins to be frozen. The most important characteristic of this phase is a drop in the planned and actual growth rates of investment spending (in some cases, even negative growth rates); accordingly, the investment and accumulation rates are reduced, and the opposite shifts in the use of national income occur (Ickes, 1986, p. 47-48).

With his theory, Bauer tried to explain the phases of slowdown and acceleration of the national income growth rates in the centrally planned economy. Despite some critical comments on his explanation of the connection between the dynamics of national income and the investment cycle, the Bauer's description of the process of making investment decisions in the CPE was close to the reality (Ol'sevich, Vasilieva et al., 1991, p. 68). It means, in my opinion, that his theory gives

us a good example of the asymmetric information existed in CPE between consumers (buyers) and producers (sellers) for the special case when the planning office actually acted as a customer (a 'buyer') i.e. the consumer of the goods produced by different enterprises.

5. The third hypothesis: Asymmetric type of macroeconomic equilibrium in a CPE

Although such a prominent researcher of the socialist economy as J. Kornai for the characteristics of demand and supply in a CPE, "did not use the mathematical formalization of demand and supply functions" and "any Marshall crosses" (Kotosz, 2014, p.134), I will dare to use them. The fact that the use of supply and demand curves is the basic tool for researching a market economy, in my opinion, should not stop us from trying to apply it also to characterize a centrally planned economy, where at least, as it was in the former Soviet Union, the market of consumer goods existed. However, if there are fundamental differences between the markets operating in a competitive environment and the markets operating under centralization and strict state control, then there must be the differences in the peculiarities of equilibrium and a graphic representation of the supply and demand functions for these (different) markets.

Figure 3. Asymmetric type of macroeconomic equilibrium for the case of CPE
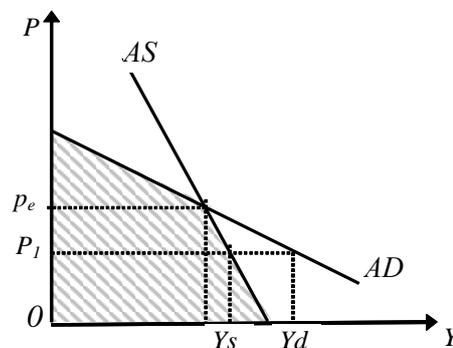
Since the centrally planned economy is comparable with a market with asymmetric information, according to assumption expressed above, the demand and supply here must be demonstrated by asymmetric arrangement of the relevant curves. So, in our opinion, the main difference in the character of macroeconomic equilibrium in the case of the centrally planned economy (in particular, in former USSR) from the classical can be the negative (or mainly inelastic) slope of the aggregate supply curve (see *Figure 3*)[1].

If we proceed from our assumption made at the beginning, about the relationship between the slope of the curves of demand and supply and the structure of prices distribution in a certain market, the asymmetric arrangement of the curves of aggregate supply and demand, presented in *Figure 3*, describes the chronic disproportionality i.e. deformation of the Soviet economy and other CPEs.

The principal disproportion, reflected in *Figure 3*, is a chronic shortage of goods when aggregate demand exceeds the aggregate supply. Indeed, *in Figure 3* we observe such a structure of prices (highlighted by hatching) in which the majority of prices (located under p_e) correspond to such a gap between demand and supply, when the former exceeds the latter (as under P_1, $Y_s < Y_d$).

Additionally, the price dispersion depicted in *Figure 3*, reflects the presence of a big sector of so-called free goods (the sector with zero-prices) that is a fundamental feature of centrally planned economies.

6. The left-sloped curve of supply and its institutional background

The left-sided slope of the supply curve for characterizing the USSR economy and other CPEs at the micro and macro levels can be explained by considering the following reasons: (1) the character

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[1] The assumption of the asymmetric arrangement of the curves AD and AS for the characteristics of the planned economy of the USSR was originally proposed by me together with Valeriy Geyets back in the second half of the 1990s (Geyets & Voznaya, 1998).

of the income effect and the substitution effect for producers; (2) motivational basis for interbranch movement of resources; (3) the peculiarities and level of (branch) barriers to entry and exit, and a general scale of monopolisation in economy as well; (4) flexibility of producers' response to consumer needs and the price elasticity of supply.

Traditionally, primarily within neoclassical economics, the income and substitution effects explain the negative slope of the demand curve for individual markets that is at the micro level. The similar approach, namely, the argumentation with use of the effects of income and substitution, is to some extent applicable to explaining the slope of the supply curve (see, for example, Night).

For the case when the supply curve (primarily at the micro level) has a positive slope, i.e. it reflects the direct functional dependence of the volumes of supply on the price level for a particular product, the income effect means that a rise in prices for a given product can increase a total revenue of a manufacturer of this product and, thus, increase the financial opportunity to purchase additional resources for increasing the production of this product.

The substitution effect means that the increase in prices for this product makes its production more attractive, namely more profitable, in the eyes of entrepreneurs in relation to the production of some other goods. Therefore, in the case of the increase in prices for this product, an outflow (movement) of resources from production of other goods that can be less profitable, in favour of the production of this good may occur; such a reallocation of resources in general also increases the supply of the product under consideration.

However, for such a realization of the income and substitution effects that explain a positive slope of the supply curve, at least the following three important prerequisites are necessary:

1) the price formation should be predominantly exogenous i.e. external in relation to the producers (sellers) of goods;

2) the positive substitution effect from the suppliers' point of view is functioning when their main motive of production (economic) activity is the obtaining profits: the capital flows into those industries that are characterized by favourable conditions for profitability;

3) the mechanism of (interregional, intersectoral) redistribution of resources should be relatively free, i.e. the movement of capital should not encounter the significant barriers to entry and exit; it means that the business environment should be predominantly competitive.

The assumptions mentioned above indicate that the nature of the supply curve reflects as well the mechanism of the movement (distribution) of economic resources and, thus, unlike the demand curve, is more obviously determined by institutional factors.

Theoretically, in a competitive market economy, one of the basic reasons defining the direction for the capital flow is the rate of return: the capital is striving for those areas of application which are characterized by a higher or at least positive rate of return, and vice versa, the capital tends to escape from industries with lower or negative profitability.

As for the economy of the former USSR and other centrally planned economies (CPE), such a motivational basis for production activities and, accordingly, capital flows, there was practically absent. Many theorists pointed out that in CPE the motive for overinvestment (at the macro level) and the motive for executing the plan (at the enterprise level) had been predominant; so the process of production itself turned out to be a goal rather than a way to maximize profits of enterprises or satisfy the consumer needs (utility maximization); whereas the latters are so important in explaining the functioning of a market economy. Thus, we are talking about the absence, or at least the insignificant role of economic basis (motivation) for economic activity in the planned economy, which should be reflected in the character of the slope of the supply curve for the case of the former USSR and other CPEs.

It is worth to note that in the former USSR and other CPEs the state ownership for the capital resources dominated, and the state acted as a dominant actor of economic activity; since the state itself is primarily a political institution, its economic activity is directly oriented toward achieving the political goals (see e.g. Berger, Koropetsky). It could be a logical explanation of the dependence of the economic structure of the former USSR on political ambitions, namely, the arms race, the

cumbersome militaristic complex, the servicing and secondary nature of civilian industries, and so on.

If we accept the thesis that the character of the resource movement in the system affects the supply function, then in the case of a competitive market economy, the positive slope of the supply curve reflects the "escape" of enterprises from unprofitability. However the high exit barriers evidenced the absence of such an escape under conditions of the former USSR; the latters, according to M. Porter, mean that enterprises continue to function even if they do not make profit or are unprofitable (Porter, 1980). For example, the Russian researcher V. Makarov, using the theoretical framework of evolutionary economics, pointed out that in the USSR there were no rules for the exit of enterprises from the industry, i.e. enterprises did not "die" naturally because the state did not let them go bankrupt, supporting even the least efficient (Makarov, 1997).

As a factor that directly influences the slope of the supply curve we must also view the level of monopolisation and the relevant pricing mechanism for the market in question. The classical definition of the supply curve supposes prices as exogenous in relation to sellers, i.e. the sellers (manufacturers) do not set own prices but should adapt to market prices. In other words, in the classical variant a supply is a function of the price. Indeed, according to microeconomics, under conditions of perfect competition, a producer of goods performs as a 'price taker' i.e. it does not set a price but 'takes' a market price to put it on its own product.

However, the situation changes in the case of a market with imperfect competition. So for a pure monopolist a price does not act as an exogenous parameter, and output – as a function of price: a pure monopolist makes decisions about the both output and prices. But if we assume an inverse relationship i.e. the dependence of the price on output, then here on a certain segment (under the effect of a positive economies of scale), a negative correlation between prices and supply volumes is observed: the growth of supply, other things being equal, leads to a reduction of the (equilibrium) level of prices, a reduction in supply – to a rise in prices.

The traditional monopolistic practice, as well as the practice of large firms in general, is the simultaneous manipulation of prices and volumes of production. Here, the different strategies can be applied. For example, on the one hand, in order to conquer the market, a firm is able to simultaneously reduce prices and increase output (supply volumes). On the other hand, a strong monopoly position enables the manufacturer to cut output and raise prices. However, in both cases there will be an inverse relationship between prices and output, which suggests a negative slope of the supply curve for the case of a monopolized market. By the way, in the textbooks on microeconomics, in the chapter analysing prices in the monopoly market, only the demand curve and the firm's cost curve are used, whereas (due to the above-mentioned features of monopoly pricing) the market supply curve is not mentioned, i.e. the monopoly appears to be devoid of the supply curve. In fact, here most likely we should not think that the monopoly is "deprived" of such a curve, but regard this curve as occupying a fundamentally different position than in a competitive market, transforming into a firm production (output) curve.

As for the economy of the former USSR, in general it presented a rare case of a stable long-term monopoly, because numerous Soviet enterprises, being formally separate (legal) units, actually belonged to the only economic entity – the state. In addition, the Soviet economy was characterized by a high level of sectoral monopolization i.e. by monopolistic position of individual enterprises and associations at the sectoral level (so called 'vedomstvenny' or departmental monopoly) (Mnyh, 1993). Since in the USSR the decisions about the both output and prices have been taking at the centralised level by "planners", even from this point of view, the supply function for characterizing the Soviet economy acquires a character different from the classical one, and corresponds rather to that presented in *Figure 3*.

The positive slope of the supply curve reflects the relative elasticity of the supply at a price, i.e. eventually the high producers' sensitivity to changing demand. The administrative economy as a whole is not a flexible system, and is characterized by cumbersomeness and complexity of the decision-making mechanism. As a result, such a system is capable of processing a fairly limited amount of information: the necessity to coordinate any actions on the level of enterprises with the

centre (with 'planners') means such a lag in decision making that the latter may no longer correspond to the current situation (Men'shikov, 1990, p. 90). In the case of such a discrepancy between the decision descending from the upper level (the centre's response to the needs of the micro- level) and the micro-level situation which has already changed, we observe not only a weak but even negative elasticity of supply in relation to demand. So we can suppose that the negative slope of the supply curve, depicted in *Figure 3*, likely describes the phenomenon of negative elasticity of supply (in relation to demand).

7. Costs as a goal of production in a CPE

If we proceed from the hypothesis about the left-side slope of the curve (graph) of the aggregate supply for the situation of the former USSR and other CPEs, this curve demonstrates a paradoxical situation (see *Figure 3*): the increase in the volume of supply (and accordingly, production) does not occur here with increasing prices (profitability), but with their decrease. Therefore it is appropriate to conclude that in such an economic system the motive for the production activity of enterprises is not the making of profit, but, on the contrary, loss or cost. But this at first sight paradoxical conclusion makes sense and agrees with the views of some other researchers.

Different investigators of centrally planned economies, (see, in particular, the theories of the cyclical fluctuations in the CPE) pointed out that under socialism the main goal for enterprises was not a profit gaining but a fulfilment of their production plans (Ickes, 1986).

Also, according to János Kornai, despite "there existed a budget constraint on paper" and "among the enterprise's compulsory plan figures there was one for profit as well", "enterprise chiefs were not mobilized to fulfil that target":

> Whether profitable or loss-making, this did not affect an enterprise's subsequent operation or development. Losses were either covered automatically, or its administratively controlled prices would be adjusted from time to time to its costs. What was demanded above all from existing SOEs was fulfilment of its production plan. Investment decisions prescribed firstly what capacity was to be created and when production was to begin; expected profitability did not play any essential role (Kornai, 2014, p. 35).

The Russian researcher V. Smirnov explicitly wrote that the economy having been formed in the former USSR at the cost of not measurable efforts and victims, was built on a specific kind of production – the production for the sake of costs; meanwhile the term 'costly economy' does not disclose the essence of the problem, obscures it, reducing everything to inefficiency and mismanagement. However it was a question of costs as the goal of production, and this makes a problem unsolvable, since the functioning of such a system becomes absurd (Smirnov, 1998, p. 148).

The costs-oriented essence of the Soviet economy was primarily demonstrated by its branch structure, where the energy-intensive branches of heavy industry accounted the lion's share. For example, in Ukraine, in the early 1990s i.e. at the time of the collapse of the USSR, in most industries, the energy intensity of production was 3-4 times higher than the West European standards; in 1990, Ukraine produced 44.9 million tons of pig iron, while in the UK and France – countries with comparable population – 3.5 and 3.1 times less, and similar proportions were observed in the production of steel (Melamed, 1997). At the same time, synthetic resins and plastics, which are the basis for many household products, in Ukraine were produced 42 times less than in the United States, 8 times less than in the UK, 3 times less than in France (Melamed, 1997, p. 23).

The fact that the purpose of production (at the micro-level) in the CPE was quite the opposite of obtaining profits was also evidenced by the practice, widespread in the Soviet economy, of redistributing funds in favour of loss-making and inefficient enterprises at the expense of profitable ones. In this case, we observe a subordination of economic activity to non-economic principles (goals), in particular to the socialist principle of justice, a specific way of implementing of which

actually undermined the economic motivation of effectively functioning units and contributed to the formation of 'free-rider' psychology of inefficient ones.

8. A dispersion-probabilistic approach to the analysis of market equilibrium in the light of the SBC theory of J. Kornai

The presented *Figures* with curves are not a simple play in mathematics. For example, the main approach proposed in this paper can be regarded in the light of the theory of soft budget constraint elaborated by Janos Kornai; so we can see that these two approaches, in my opinion, are in accordance with each other.

Considering the connection between a price dispersion and the slope of the curves of demand and supply, we actually regard these curves as playing the role of constraints for such a dispersion: the growth of the price elasticity of demand or (and) supply leads to decrease in a price dispersion, the increasing insensitivity of the buyers and (or) sellers to prices leads to the increase in a price dispersion. So the situation of comparatively low elasticity (of supply or/and demand) and a small price dispersion can correspond to the (comparatively) hard budget constraint, and the situation of the higher price dispersion and the low elasticity (of supply or/and demand) can correspond to the soft budget constraint (in Kornai's conception). Is it really so? For example, Kornai marks that "*the SBC syndrome reduces the price and cost sensitivity of decision-makers*" (Kornai, 2014, p. 33). Also, he underlines that "*key constituents in the definition of the SBC syndrome are expectation and behaviour*" (2014, p. 28). The curves of supply and demand for the micro- level and the prices set depicted by these curves (in my explanation) are also related with expectation and behaviour of the sellers and buyers: for instance, the sellers can regard their supply curve as the lowest price frontier (of the set of prices) because the prices located under this curve mean losses for them (the case when a price does not cover costs).

In the case of asymmetric type of macroeconomic equilibrium in CPE (*Figure 3*) we are dealing with soft budget constraint primarily on the side of producers (sellers), who are indifferent to prices in the sense that the latters mainly do not cover their costs.

In the case of symmetric arrangement of the curves of supply and demand (which is theoretically a characteristic of the competitive market economy), we are dealing with comparatively hard budget constraint. Meanwhile, according to presented dispersion approach, the combination of the comparatively elastic curve of demand and the comparatively elastic curve of supply (but not perfectly elastic) should describe, in the first approximation, the price distribution which resembles the normal (Gaussian) distribution of prices with the light tails of distributions (see Fig. 4).

Figure 4. *Light (I) and heavy (II) tails of distribution*
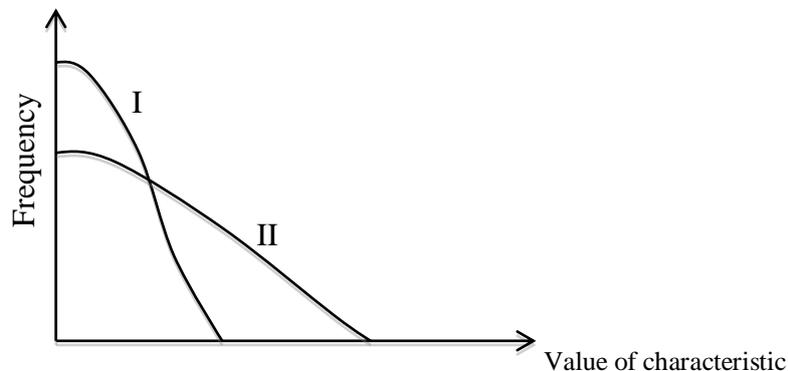
However, the shift of the curve of demand in the less elastic position, according to our approach, means the appearance of a heavy tail in a price distribution (*Fig. 5, Fig. 5.2*). Exactly such a shift we must observe in the case of the soft budget constraints, described by Kornai: "*While economic conditions look sound and households gain quite easy access to credit, they fail to sense*

their budget constraint and their spending speeds on. The more the economy thrives, the greater the spending drive becomes" (Kornai, 2014, p. 28).

Figure 5. A price distribution and the stability of market equilibrium

1. Stable equilibrium   2. Unstable equilibrium
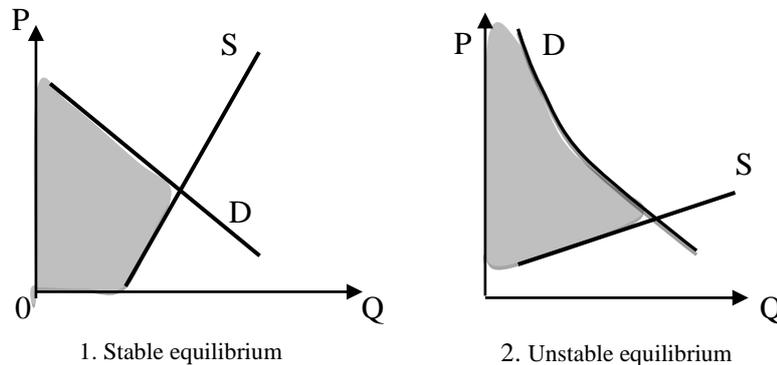
In probability theory, heavy-tailed distributions are probability distributions whose tails are not exponentially bounded. In comparison with the Gaussian distribution, for heavy-tailed distributions the probabilities of deviations from the mean values are much larger. The average values, calculated from the samples, are unstable and unrepresentative, since the law of large numbers is not valid here. In other words, a price heavy-tailed distribution is related with (a price) uncertainty.

If we compare the prices set depicted in *Figure 5.1* with the prices set in *Figure 5.2*, the variance calculated for the first case should be smaller than the variance calculated for the second case. Traditionally, the variance is associated with variability and volatility and, for example in investment analysis, is used for measuring uncertainty and risks. In its turn, the (market) uncertainty should be related with market instability, if, for example, to regard the latter in the meaning of Frank Knight (1921).

Returning to the case of CPE (*Figure 3*), the prices dispersion here is not restricted by the supply curve in direction of their possible decreasing; however, from the bottom, it is limited by values of zero prices. On the other side, from above the set of prices is limited by the demand curve. These restrictions mean a comparatively stable (market) state, if we regard the market instability as a price uncertainty. Despite this quasi stability of the CPE, however, the multitude of zero prices (free goods) meant the accumulation of inefficiency in economy.

If we look at the two sets of prices depicted in *Figure 3* (asymmetric type of equilibrium) and *Figure 5.2*, we can notice something similar between them, namely – the asymmetry in prices distribution. This gives us a hint to make parallels between the centrally planned economy and the market economy in the phase of accelerating credit expansion (i.e. on the eve of the cyclic recession). Do they really have some similarities? Using the SBC theory of J. Kornai, we must give a positive answer and even name this similarity: a soft budget constraint. The difference: in the centrally planned economy the SBC syndrome was chronic; in the market economy, it reveals itself as small islands and also as (temporary) expansions on the eve of economic recessions. But despite differences, in the both systems the SBC syndrome is related with asymmetric information and, correspondingly, with a process of adverse selection when the more efficient economic actors give a 'palm branch' to the less efficient ones.

9. Conclusion

According to the approach proposed in the paper, the SBC syndrome is related with asymmetry of information, the character of equilibrium (stability) on the relevant markets, and with deformed structure of economy (reflected in the deformed structure of prices). Correspondingly, a soft budget constraint on the macro- level can be depicted with help of the curves of aggregate supply and aggregate demand. The situation of comparatively hard budget constraint corresponds to the classical symmetric crossing of the curves of supply and demand, which also characterises the (so

called) market economy. The SBC that characterises the centrally planned economy can be described by asymmetric arrangement of the curves under consideration. Also, for the case of the market economy, the shift of the curve of the aggregate demand (primarily under the influence of credit expansion) in the less elastic position is related with both phenomena – the expansion (strengthening) of the soft budget constraint syndrome and a weakening of macroeconomic stability. In turn, this process is accompanied by a growth of asymmetry of information and a process of adverse selection in economy. The latter means, for example, the growth of financial bubble and the share of those investments (and economic actors) which have a predominantly speculative nature and are not connected with innovative process and the growth of productivity in economy.

LITERATURE

Akerlof, G. A. (1970). The market for "lemons": Quality uncertainty and the market mechanism. *The Quarterly Journal of Economics*, 84 (3), Pp. 488-500.

Berger, P. L. (1986). *The Capitalist Revolution*. Basic Books [Publisher].

Eucken, W. (1995). Osnovnyie printsipy ekonomicheskoy politiki [*Grundsätze der Wirtschaftspolitik*], Moscow, Progress [Publisher]. [In Russian translation]

Geyets, V., Voznaya, L. (1998). Asimmetrichnyi tip ravnovesiya i krizis predlozheniya v perehodnoy ekonomike [Asymmetric type of equilibrium and the supply crisis in the transition economy], *Ekonomicheskaya nauka sovremennoy Rossiyi*, No 4. [In Russian]

Ickes, B.W. (1986). Cyclical Fluctuations in Centrally Planned Economies: A Critique of the Literature, *Soviet Studies,* Vol. 38, No 1, P. 37.

Knight, F.H. (1921). *Risk, Uncertainty, and Profit*. Available at: http://www.econlib.org/library/Knight/knRUP.html

Kornai, J. (2014). The Soft Budget Constraint, *Acta Oeconomica*, Vol. 64 (S1) pp. 25–79. DOI: 10.1556/AOecon.64.2014.S1.2

Kornai, J. (2012). What Economics of Shortage and the Socialist System Have to Say to the (Hungarian) Readers Today, *Acta Oeconomica*, Vol. 62 (3), pp. 365–384. DOI: 10.1556/AOecon.62.2012.3.5

Koropetskiy, I.-S. (1998). Ekonomichni pratsi: Zbirnyk vybranyh statey [Economic works: collection of selected articles], Kyiv, Smoloskyp [Publisher]. [In Ukrainian]

Kotosz, B. (2014). Heterodoxies in the Work of János Kornai: How Far from the Mainstream? *Journal of Heterodox Economics*, Vol. 1 (2), pp. 131-144.

Makarov, V.O. (1997). O primeneniyi metoda evoliutsionnoy ekonomiki [On the application of the method of evolutionary economics], *Voprosy Ekonomiki*, № 3, p. 28. [In Russian]

Melamed, M. (1997). Ekonomichnyi portret u mizhnarodnomu vymiri [Economic portrait in the international interior], *Visnyk NBU*, No 11, p. 23. [In Ukrainian]

Men'shikov, S. (1990). *Sovetskaya ekonomika: katastrofa ili katarsis?* [The Soviet economy: a catastrophe or catharsis?], Moscow, Inter-Verso. [In Russian]

Mnyh, N. (1993). Monopolizatsiya ekonomiky Ukrainy i mozhlyvosti provedennya antymonopol'noyi polityky [Monopolization of the Ukrainian economy and the possibility of conducting antimonopoly policy], *Ekonomika Ukrainy*, №3, pp. 35-41. [In Ukrainian]

Ol'sevich, Yu., Vasilieva, R., et al. (1991). K sbalansirovannoy ekonomike: dialog s sovetologami [*Towards a Balanced Economy: The Dialogue with Sovietologists*], Kiev, KGU [Publisher]. [In Russian]

Porter M. (1980). *Competitive Strategy: Techniques for Analyzing Industries and Competitors*, New York: The Free Press.

Smirnov, V. (1998). Mineral'no-syrievoy kompleks v strukture ekonomiki Rossii [Mineral and raw materials complex in the structure of the Russian economy], *Voprosy Ekonomiki*, № 4, pp. 148. [In Russian]

Sraffa, P. (1926). The Laws of Returns Under Competitive Conditions. *The Economic Journal*, vol. 36(144), p. 535-550.

Voznaya, L. (2005). Fizika vremeni v prognozirovaniyi finansovyh katastrof [Physics of Time in Financial Catastrophes Forecast], *Voprosy Economiki*, 8. [In Russian]