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SOME MICROECONOMIC ASPECTS OF THE TRANSITION PROCESS

Acknowledgments

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Introduction

New independent Ukraine is going through a difficult time in its transition from a central planned to a market economy. This process revealed a number of unpleasant features of Ukraine’s national economy. Among them are pervasive tax evasion, a falling down of the Gross Domestic Product (GDP), a rapid increase of national debt, widespread corruption, crisis of system of education, etc. Macroeconomic policy of Ukrainian government has not been very successful. One of the reasons is that Ukrainian economists and decision makers have not paid enough attention to microeconomic consequences of macro decisions. Ukraine’s future depends basically on whether the bulk of the workforce will have incentive to work. This is a part of a more general problem: that of relationships between motives, incentives, and behavior.

Since 1988¹ I have studied the reaction of individuals to different incentives. This gives the

¹ See *Ястремський А. И. Модель оптимізації норми отчислень і її аналіз// Тезиси докладів научної конференції “Теорія і практика перестройки господарського механізму”, Москва, Московський університет, 1990.*

basis to explain a lot of economic effects under transition, especially a phenomenon of low labor productivity in the former Soviet Union comparatively with USA, Japan and other countries with developed market economy. I approached this problem by using a standard model of labor supply (see, for example, its description and analysis in H. Varian²) and expanded upon it by incorporating features that reflect some peculiarities arising from social-economic environments of centrally planned economy.

My nearest task is to study some microeconomic effects and peculiarities of individual behavior in the different stages of transitional economy, beginning from an economy, which is undergoing transition up to developed market economy. I would like to understand why in contemporary Ukraine the majority of businesspersons do not have encouragement to pay taxes, to organize legal profitable production, why employees do not have incentives to productive work.

One of the main idea of my research is that it is impossible to understand the nature and peculiarities of the Transition without careful studying it’s initial point — Centrally Planned Economy and it’s collapse.

The Transition from the Centrally planned to Market economy is mainstream of contemporary economic thought. According to historical point of view the Transition is one of the links in the chain:

*Centrally Planned Economy — Collapse of the
Centrally Planned Economy — Transition — Market
Economy.*

In my research I have tried to describe the vision of some of links, in particular, the Centrally Planned Economy, the Collapse of the Centrally Planned Economy, and the Transition from point of view of individual workers.

² *Varian, H. R. Intermediate Microeconomics: A Modern Approach, 3rd Edition, New York: W. W. Norton & Company: 1993, p. 623.*

Current economic and political situation in Ukraine**Economic problems**

Half of Ukraine's economy is in the 21st century, half remains in the middle ages.

Charles Clover, Financial Times observer

It is impossible not to continue so picturesque simile. "...while the country (Ukraine³) remains capable of building some of the most advanced technology in the world, from lasers to nuclear turbines to rockets boosters, its GDP has fallen by one half since 1991 and farmers have gone back to using horses because they cannot afford gasoline for their tractors."⁴

Really, since 1991, the first year of new independent Ukraine, the levels of production and welfare have been decreasing.

The production fall down is one of character features of the first step of Transition. Then the level of production begins to rise. The majority of transition countries, including the countries, which were the parts of the former Soviet Union, have passed through painful beginning of the Transition and started to increase the level of GDP. At the same time, Ukraine is continuing to suffer from the start of Transition. What is the reason for? Who is guilty?

The majority of experts and economists on transition economics consider the main reason of the failures of Ukrainian transition in delay of it transition reform performance.

For evaluating of the level of the Transition reforms the European Bank for Reconstruction and Development (EBRD) uses the Indexes of Reform Progress (IRP). IRP is a sum of subindexes of institutional changes in nine dimensions: large-scale privatization, small-scale privatization, enterprise restructuring, price liberalization, trade and foreign-exchange system, competition policy, banking reform, securities markets, and legal rules on investment. Each dimension is scored on a scale from 1 to 4, where 4 means institutional conditions comparable to those of advanced market economies. According to the 1995 and 1997 EBRD reports IRPs for some country are follows (see the Table 1).

J. D. Sachs⁵ has proved statistical relation between economic growth and IRP. He performed a series of econometric estimations, one of which is given below:

$$\text{Growth (1989—95)} = -23.15 + 0.62 \times \text{IRP} \quad (1)$$

According to the last formula each unit of IRP boosts GDP growth by 0.62% on average.

³ Author insertion.

⁴ *Clover, Ch.* Dissent means descent. **Financial Times**, May 5, 1988.

⁵ *Sachs, J. D.* The Transition at Mid Decade, **American Economic Review**, May 1996, 86 (2), pp. 128—133.

Table 1. Index of Reform Progress for some transition countries

Country	Index of Reform Progress
Bulgaria	23
Czech Republic	33
Hungary	33
Poland	33
Romania	23
Russia	23
Slovakia	31
Ukraine	20

Analogous estimations were made by M. Selowsky and M. Ricardo⁶ using the following equation and combined data for 25 transition economies during the 1990—95 period:

$$\text{GROWTH}_t = -10.65 + 11.42 \text{LIB}_t - 15.70 \text{WAR}_t \quad (2)$$

where $\text{WAR} = 1$ for countries in conflict in period t , 0 — otherwise, and where LIB_t is aggregate liberalization index.

The aggregate liberalization index is a weighted average of indexes of reforms in three areas: internal reforms (price liberalization, elimination of state orders); external reforms (foreign trade, exchange-rate regime); and private-sector reforms (privatization, banking reform).

These results also highlight the crucial role of reforms in economic growth of transition countries.

The Table 2 contains more recent estimations of IRP:

Table 2. Progress in transition in eastern Europe, the Baltics and the Commonwealth of Independent States (CIS)^{7,8}

Country	Index of Reform Progress (1997)
Albania	21
Armenia	20
Azerbaijan	16
Belarus	13
Bulgaria	22
Croatia	24
Czech Republic	27
Estonia	27
FYR Macedonia	21
Georgia	21
Hungary	28
Kazakhstan	21
Latvia	29

⁶ *Selowsky, Marcelo and Ricardo, Martin.* Policy Performance and Output Growth in the Transition Economies, **American Economic Review**, May 1997, 87 (2), pp. 349—353.

⁷ CIS includes as full or associated members all countries of the former Soviet Union, except the Baltic states

⁸ Transition Report 1997, European Bank for Reconstruction and Development, 1997.

Table 2

Country	Index of Reform Progress (1997)
Lithuania	24
Moldova	21
Poland	26
Romania	22
Russian Federation	23
Slovak Republic	27
Slovenia	25
Tajikistan	13
Ukraine	19
Uzbekistan	19

In 1995 Ukraine had one of the lowest IRP. In 1997 the situation in Ukraine was not improved.

Slow steps on economic reforms way in Ukraine does not mean the policy of drift from the state side. Moreover, by force of soviet habit Ukrainian state tries to control everything. For example, the certain increasing of private sector, which had occurred those years, was not due, but in spite of state regulations. This increasing could be much more if the state did not introduce too high tax rates. Producer attempts to avoid tax press results in the growth of large informal activity both in private and state sector as well.

Data, such as those in Table 3, are consistent with this claim.

Table 3. Share of the unofficial economy in GDP, 1995⁹

Country	Share of the unofficial economy in GDP (%)
Azerbaijan	60.6
Belarus	19.3
Bulgaria	36.2
Czech Republic	11.3
Estonia	11.8
Georgia	62.6
Hungary	29.0
Kazakhstan	34.3
Latvia	35.3
Lithuania	21.6
Moldova	35.7
Poland	12.6
Romania	19.1
Russian Federation	41.6
Slovak Republic	5.8
Ukraine	48.9
Uzbekistan	6.5

⁹ Kaufmann, D. and Kaliberda, A. Integrating the unofficial economy into the dynamics of post-socialist economies: A framework for analysis and evidence, Development Discussion Paper No. 558, Harvard Institute for International Development, pp. 81—120.

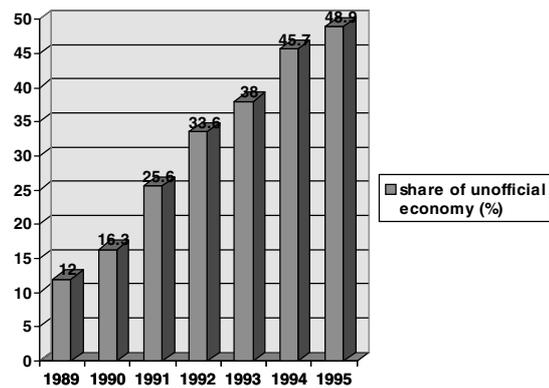


Figure 1. Growth of unofficial economy in Ukraine

It is need to say that state economic policy in Ukraine is determined by two forces: government and Parliament, which were acting in different manner. For example, the only exit of the described situation was to lower tax rates, what has been reflected in the proposals presented by the government to parliament at the end of 1996. The adoption of tax reform package should make the basis for formation of “Budget 1997”. Parliament debates had taken quite long time, what results in the delay of budget approval. By the middle of summer only two solutions on tax problem had been passed (about VAT and corporate tax). Even here, it was adopted by Parliament, that the law on VAT will be implement only in October. As concerns the law on personal income tax, it had passed the final reading, but had not passed finally. But at least important steps in reforming of tax system had been done, scilicet: VAT was changed on 20 % in base rate and all exemptions were eliminated; the corporate profit tax was switched from revenue to profit taxation and changed on 30 % in base rate; the individual income tax decreased from 40 % to 30 % in the rate, the payroll tax reduces a little too. From 51 % it becomes 49 %, instead of 34 %, which was proposed by government. The last one, however, did not stop its attempts to promote tax reforms.

One of the achievements of independent Ukraine on the way of reforms is the setting its national currency “hryvnia” (гривня). The hryvnia was fixed in September of 1996. “After a painful bout of hyperinflation, Kiev (Kyiv)¹⁰ has brought inflation down to an annual 10 per cent and launched a relatively stable national currency, the hryvna (*hryvnia*)”¹¹.

However, the victory over inflation was won in a very specific way. Instead of expand money supply

¹⁰ “Kiev” is English spelling from Russian. Now the English spelling from Ukrainian “Kyiv” is more appropriate.

¹¹ Freeland, Ch. and Clover, Ch. Captive economy threatens freedom. *Financial Times*, May 5, 1988.

by printing machine, government has invented a very simple way: not to pay some internal liabilities. Namely, salary to employers on state enterprises and organizations in different branches of economy (first of all in education, culture, health), some others. This idea was caught promptly by managers of state and commercial enterprises and had generated the crisis of mutual default.

In 1998 the overdue debts of the Ukrainian economy stand at a staggering \$60bn, according to studies by the European Union's Tacis program and HIID. Most of these debts are owed between enterprises, but workers and pensioners are owed about \$3—4bn by public and private entities.

Meanwhile, the amount of barter in the Ukrainian economy grew to 66bn hryvnia (\$34bn) worth of transactions last year, according to the state statistics committee.¹²

It is well known that the transition process is not set with roses in each transition country. Each transition is a road filled with tactical losses and strategic gains. In some cases, the short—run (tactical) losses can be very painful and, as such, be very dangerous, as people find it difficult to relate present events with long—run equilibrium. As a result, public support for the continued undertaking of reform weakens and the process faces the danger of being stalled or reversed. My point of view is that Ukraine's suffering from the transition process is most painful, so that, short—run losses by the Ukrainian people can eclipse the perspective of a normal society construction.

As A. Aslund notes "...in Ukraine we see how dangerous it is not to act vigorously for a fundamental economic and political transformation"¹³.

The question of why the reforms are delayed in Ukraine logically arises.

Political situation

The most important achievement of Ukrainian society since 1991 is that Ukraine has not been roped in any military conflicts. Remembering the history of the Soviet Union and Russian Empire, of which Ukraine was a part for over 300 years, we can conclude that the period 1991—98 has been the most peaceful period in Ukraine's history. This achievement becomes even more noteworthy, when account is taken of the fact that the 20th century saw most sanguinary events such as the Russian—Japanese War, First World War, the Russian Civil War, Stalin's collectivization, artificial famine in Ukraine and extermination of Ukrainian intellectual

elite, Soviet—Finland War, World War II, Soviet—Japanese War, Soviet interventions in Hungary (1954), Czechoslovakia (1968), Afghanistan (1979), Caribbean crisis, Soviet support of some non-democratic regimes. The last crime of Soviet regime in Ukraine has been the Chornobyl catastrophe in 1986.

In 1996 a progressive constitution was adopted by Ukrainian Parliament. All changes while have taken place in the state administration, inclusive of elections of Parliament and President of Ukraine were legitimized.

After the collapse of the Soviet Union Ukraine had the third largest arsenal of nuclear weapon in the world. In particular, 176 intercontinental missiles were stationed on its soil.¹⁴ The Ukrainian Parliament made historical decision to make of Ukraine a non nuclear country.

The last election (i.e., March 29, 1998) to the Ukrainian Parliament (Verhovna Rada) was very successful for the left—oriented parties (see Table 4, p. 8).

The previous Ukrainian Parliament was also very leftward oriented. As such, it created serious obstacle for some progressive decisions and initiatives of the President, government and the Central Bank. We have already spoken about the tax reforms campaign. The Parliament has not created a friendly climate for foreign investment, and a reasonable tax system.

Examples could be added. The Parliament leftists had formed a strong lobby for non profitable state enterprises and archaic collective farm system in agriculture.

At the latter, needed privatization reforms in agriculture has been retarded by the parliament's hesitation. This was in contradiction to the constitution of Ukraine, which declared private property rights including land ownership.

Another example is born by the opposition from parliament to a more rapid pace of privatization. A case in point was the struggle between the Parliament and the government in 1997 over the list of enterprises which would be privatized. Due to the Parliament resistance against privatization, the government was able to list only 5,155 enterprises among those to be privatized instead its original list of nearly six thousand enterprises.

The paradox is that the left Parliament has been legislatively and democratically elected by the people.

Paradoxical behavior of Ukrainian voters once more corroborates the necessity of studying the

¹² Clover, Ch. Ukraine pays for hollow victory, *Financial Times*, January 21, 1998, p. 17.

¹³ Aslund, A. Ed. *Economic Transformation in Russia*. New York, St. Martins Press, 1994. viii + 190 pp.

¹⁴ Jehiel, P., Moldovanu, B, and Stacchetti, E. How (Not) to Sell Nuclear Weapons, *American Economic Review*, September 1996, 86 (4), pp. 814—829.

Table 4. Results of election to the Ukrainian parliament in March of 1998¹⁵

Party	Number of voters, who support this party	Percentages	Number of deputies mandates	Political orientation ¹⁶
Communist party of Ukraine	6.550.353	24.65	84	radical left
Narodnii Ruh (People Movement ¹⁷) of Ukraine	2.498.262	9.40	32	radical right
Block of Socialist and Agrarian Parties	2.273.788	8.56	29	left
Greenpeace of Ukraine	1.444.264	5.44	19	center
People-democratic party ¹⁸	1.331.460	5.01	17	right
Ukrainian association "Gromada (Sodality)" ¹⁹	1.242.235	4.68	16	right
Progressive socialist party of Ukraine	1.075.118	4.05	14	left
Social-democratic party of Ukraine	1.066.113	4.01	14	center

transition process on micro-level, in particular, by analyzing and understanding the behavior of employees.

Ukraine way: what to choose?

We have said that the nation—state is the only effective implementing unit for economic development of latecomers.

Benidict Anderson

Japan in 1946 and Ukraine now

Our century was not only very bloody, it has also demonstrated good examples of nations and states revivals, and economic miracles. Most notable examples of these are Germany and Japan. In addition, since 1989, Japan has been the largest provider of bilateral Official Development Assistance (ODA). This is why the Japanese economists' and policy makers' vision of transformation problems and Japanese economic experience are of big interest for Ukrainians.

For scholars of post — soviet and Ukraine economies, Japan's transition from a wartime controlled economy to a market economy is important especially as such study offers suggestions and lessons which are relevant to the transition of East European and the Former Soviet Union (EEFSU) countries from a socialist economic system.

A lot of economists have studied the phenomena of Japanese economic miracle, some of them have fulfilled a comparative analysis between initial points of Japan recovery and Ukraine transition (see, for example, J. Sachs²⁰). In Table 5 I had tried

¹⁵ Golos Ukraini, April 8 of 1998.

¹⁶ Author's evaluation.

¹⁷ Author's translation.

¹⁸ Author's translation.

¹⁹ Author's translation.

²⁰ *Sachs, J. D.* Discussion (Teranishi, Juro. Economic recovery, growth and policies: 'gradualism' in the Japanese context), *Economic Policy*, December 1994. — Pp. 149—153.

to generalize their results^{21, 22} to show briefly the common features and the differences between the economic situation in modern Ukraine and post-war Japan.

As table shows, it appears that there are a lot of common. So Japanese experience could be of big use for Ukrainian economists.

What ways Japan had chosen to overcome the post-war crisis? What steps were more or less effective on this way?

IMF — World Bank and Japanese approaches to transition and developing economies

Apparently, in postwar Japan there were a lot of discussions²³ about the ways out of economic crisis, especially the ways out of inflation. The main of them could be found in the report "Basic Issues of Japanese Economic Reconstruction"²⁴ by Ministry of Foreign Affairs (1946) and colligated as follows:

a) "Quick Stabilization" due to shock therapy by radical monetary policy (the main ideologist Kihachiro Kimura, Member of Parliament);

b) "Conditional Quick Stabilization" due to shock therapy, which should be implemented after breakthrough the certain level of national output (the main ideologist Prof. Hiromi Arisawa, Tokyo University);

²¹ *Sachs, J. D.* Discussion (Teranishi, Juro. Economic recovery, growth and policies: 'gradualism' in the Japanese context), *Economic Policy*, December 1994. — Pp. 149—153.

²² *Teranishi, Juro.* Economic recovery, growth and policies: 'gradualism' in the Japanese context, *Economic Policy*, December 1994. — Pp. 137—149.

²³ See, for example, *Arisawa, Hiromi, and Nakamura, Takahide.* Design of Postwar Economic Policies, vol. 1, Tokyo, Tokyo University Press (in Japanese), 1990.

²⁴ Ministry of Foreign Affairs. Basic Issues of Japanese Economic Reconstruction (in Japanese), Tokyo: Ministry of Foreign Affairs, 1946.

²⁵ Ukrainian abbreviations: kolgosp (колективне господарство) — collective farm, radgosp (радянське господарство) — soviet (state) farm.

Table 5. Post—war Japan and Ukraine now (comparative analysis)

	Economic characteristics	Japan	Ukraine
<i>Differences</i>			
1.	Lasting of a controlled economy existence	9 years: from 1937 to 1945	74 years from 1917 to 1991
2.	Market economy institutions (like financial markets, a tax system and so on)	Well-developed	Not exist
3.	Initial conditions	The problem of industrial resources and underutilization of productive capacity, so called "supply bottlenecks"	The problem of large misallocations of resources. The crisis of overcapacity in the traditional heavy industries (coal, steel, chemicals and so on)
4.	Privatization	Not an important issue	The crucial point
5.	Availability of experience in using modern market economy mechanism	Great experience	Not exists
<i>Common</i>			
1.	The necessity of private ownership promotion	Private ownership promotion had developed a dynamic response in the 1950s and 1960s.	Private ownership promotion is a chance to develop a dynamic response as in Japan in the 1950s and 1960s.
2.	The necessity of land reform	The crucial point: to break up large private firms	The crucial point: 1) land sale; 2) restructuring of collective and state firms ('kolgosp' and 'radgosp'). ²⁵
3.	The necessity of huge re-allocation of labour resources for creation the flexible labour market	Surplus labour in agriculture, which had become after reallocation the resource of growth	Surplus labour in state industry, which after reallocation could be moved to private sector and services, providing recovery and later growth of the economy.
4.	The necessity of fosterage the competition in the domestic market	Must act to foster the domestic market, competition by breaking up industrial and international trade monopolies (the burden of military economy).	Must act to foster the domestic market competition by breaking up the state monopoly (the burden of socialistic economy) in all branches of economy and international trade.
5.	The necessity of reorientation the economy from military- to a civilian-oriented	Economy developed for the war conducting needs, as the World War II hangover	Economy with a developed military-industrial complex, as a cold war hangover
6.	The necessity of macro-economic stability	The package of macro-economic stability measures had been implemented.	The package of macro-economic stability measures is being developed.

Table 6. Comparison of development and transition strategies.²⁷

	Neoclassic approach	Japanese approach
Highest priority	Financial and macroeconomic (fiscal and BOP deficits, money, inflation, debt)	Real (output, employment, industrial structure)
Time scope	Short-term (solving problems as they arise)	Long-run (long-run targets and annual plans)
Basic attitude toward market	Laissez-faire; minimal government intervention	Active support by government
Speed of systemic transition	As quickly as possible	Will take long time even with maximum effort

c) “Intermediate Stabilization” due to gradualism (gradually lowering inflation policy) based on foreign ODA (the main ideologist the Economic Stabilization Board).

In general the second approach had got best of it. When output had recovered to more than half the prewar level (it was happened in 1949), the Japanese government implemented the so called “Dodge Line” — the package of stabilization measures designed by American advisor Joseph Dodge. In grain that was the variant of shock therapy, including tight budget and money, elimination of subsidies, unification of exchange rates and so on, which is well known now as IMF-approach. However it is important to high-light, that shock therapy was not implemented immediately after the war. That stands out the Japanese approach.

The IMF-World Bank had it’s own view on the problem, which is quite different from Japanese approach. The major differences are summarized in Table 6.

It could be easy to see from the table, that IMF-World Bank is a firm supporter of shock therapy.

However, Professor J. Teranishi insists on the inappropriateness of shock therapy to the economic reforms of Japan. Unlike shock therapy Japan’s gradual approach emphasized the adjustment of the existing firms to the new circumstances.

Tatsuo Kaneda underlines the role of speed in systemic reform: “... no overnight victory is possible for a large change involving the entire society, like transition to a market economy.”²⁸

The role of annual plans was also very important for Japan recovery. “To rebuild the Japanese

economy from complete devastation, we need comprehensive and concrete annual reconstruction plans for the coming years. To speed up the reconstruction timetable, limited resources must be selectively used for starting an expansionary reproduction cycle. A liberal economy wastes economic resources and thus should not be adopted.” (Ministry of Foreign Affairs)²⁹.

Professor Juro Teranishi of the Hitotsubashi University analyses post-war Japanese economic growth up to 1972 and makes three conclusions³⁰:

1) Stable corporate ownership and governance, and macroeconomic stability are crucial in the transitory and growth phases.

2) New investment and its financing are crucial to economic recovery. Intersectoral adjustment of production in response to relative price changes cannot be accomplished by shifts in labour alone; it also requires capital investment.

3) The Japanese government was important in coordinating investment in both 1946—50 period (the phase of stabilization and rehabilitation), and 1951—55 period (the transition phase from recovery to growth), but in different ways. In the recovery phase, when investment was related to existing technology and coordination of the pecuniary externalities of investment was needed, polices such as directed credit and price controls were effective. In the transition phase, when investment was related to new, imported technology, the industrial policy of coordinating strategic shifts in production was an effective method of intervention.

As to the last conclusion, another prominent transition economist Professor Jeffrey Sachs, discussing the Japan’s experience of reforms for

²⁷ Ohno, Kenichi. Overview: creating the market economy. (In Japanese Views on Economic Development, edited by Kenichi Ohno and Izumi Ohno.— Routledge, New York and London, 1998.— 332 p.) — 4 p.

²⁸ Kaneda, Tatsuo. Regime and People: Revival of A Small Country in Central Asia, Tokyo: Japan Institute of International Affairs (in Japanese), 1995.

²⁹ Ministry of Foreign Affairs. Basic Issues of Japanese Economic Reconstruction (in Japanese), Tokyo: Ministry of Foreign Affairs, 1946.— 92 p.

³⁰ Teranishi, Juro. Economic recovery, growth and policies: ‘gradualism’ in the Japanese context, Economic Policy, December 1994, pp. 137—149.

Table 7. Economic Role of the State During Transition

Model	Legal environment	Regulatory environment
<i>Invisible hand</i>	Government is no above law and uses power to supply minimal public goods. Courts enforce contracts.	Government follows rules. Regulation is minimal. Little corruption.
<i>Helping-hand</i>	Government is above law but uses power to help business. State official enforce contracts.	Government aggressively regulates to promote some businesses. Organized corruption.
<i>Grabbing-hand</i>	Government is above law and uses power to extract rents. The legal system does not work. Mafia replaces state as enforcer.	Predatory regulations. Disorganized corruption.

Ukraine (see J. Sachs ³¹), underlined, that it will almost surely be individual entrepreneurs and foreign investors in Ukraine who will spot the viable opportunities for Ukraine, rather than the state bureaucracy.

From my point of view the role of state in Ukraine is especially specific and important. The important distinction of contemporary Ukraine and Japan in 1946 is that Ukraine must create it's own state. In comparison with Japan and European transition countries Ukraine has to solve double problem — to create state and market environment simultaneously. Unfortunately, Ukrainian people has lost any tradition of state administration during over last 300 years of unequal union with Russia.

Government and state role in transition

One of the most important distinction of Japanese vision of transition is crucial role of government. Accordingly to Kenichi Ohno ³² the active role of government is particularly important in the early stages of development and in economic crisis. Without wise government, an underdeveloped economy will not take off. Government intervention is a necessary — although definitely not sufficient — condition for starting and sustaining economic growth. However, the fundamental difficulty of state and government in the developing world stems from it's dual role as the subject and object of reform. The situation is analogous to a sick doctor. In Ukraine it is aggravated by the fact that doctor is too young. Using historical measures he is in babyhood: state independence since 1991 in comparison with 350 years of the national state absence. This factor does not authorize marking the time of Ukrainian state, but it overburden the situation. The investigator of national state

³¹ Sachs, J. D. Discussion (Teranishi, Juro. Economic recovery, growth and policies: 'gradualism' in the Japanese context), *Economic Policy*, December 1994.— 149—153.

³² Ohno, Kenichi. Overview: creating the market economy. (In Japanese Views on Economic Development, edited by Kenichi Ohno and Izumi Ohno.— Routledge, New York and London, 1998.— 332 p.— 7 p.

development problems Benedict Anderson said, that the nation-state is the only effective implementing unit for economic development of latecomers. But the nation-state is not something that naturally emerges in any society. Rather, it is often an "imagined community" created by government for the pursuit of certain goals. Nationalism and technological progress have played key roles in its formation process.³³

Ukrainian state appeared on the wave of transition to market economy, but national Ukrainian consciousness has not formed yet. It needs a time.

The role of state and government can be classified by the next table (Table 7)³⁴.

According to Timothy Frye and Andrei Shleifer, the survey organized in Moscow and Warsaw shops gave the evidence points to the relatively greater relevance of the invisible-hand model to describe Poland, and of grabbing-hand model to describe Russia.

Unfortunately, I am not acquainted with similar direct investigations (if any exists) dealing with classification of role of the Ukrainian state and government in market economy construction. However, ugly growth of unofficial economy in Ukraine (see Table 3, p. 6, and Figure 1, p. 6) do not give an opportunity to conclude that Ukrainian state is much better in civilized market creation than Russian one. Furthermore, the Table 3 says that the share of the unofficial economy in Ukrainian GDP (48.9) is bigger, than in Russian one (41.6 %).

So, using the terms by Timothy Frye and Andrei Shleifer we can say that *grabbing-hand model* is the most appropriate model of Ukrainian state in transition process. From my point of view, it is the core of transition problem in Ukraine.

³³ Anderson, Benedict. *Imagined Communities: Reflections on the Origin and Spread of Nationalism*, London: Verso, 1983.

³⁴ Frye, Timothy and Shleifer, Andrei. The Invisible Hand and The Grabbing Hand, *American Economic Review*, May 1997, 87 (2), pp. 354—358.

Now we could give a short answer on the questions stated above. Tatsuo Kaneda³⁵ criticized the Russian policy in Transition. A lot of this critics could be applied directly or modified to Ukrainian economic state policy. First of all there was no long-term state target vision of the market economy was provided. To be more accurately, there was not common vision among the government and the Parliament. Second, political aspects of the reforms were ignored. Third, transition to market economy as a socio-engineering task was thought to be completed within a few years. Transition to market economy as an economic task was the same way minded. It was expected the growth beginning in a few years and output recovering automatically. And at least, a very important miscarriage, was that transition process was incorrectly assumed to induce immediate change in the behavior of individuals and firms.

The behavior of individuals and firms is just what I'd like to concentrate on hereinafter. Namely, the behavior of individuals and firms begot such political and economic situation in Ukraine as we have spoken above. That is the biggest Ukrainian paradox: the state administration, government and parliament have been appeared as result of democracy. The President and Parliament of Ukraine were elected by people, and the President has appointed the government. So, imperfect Ukrainian state and government are the product of the popular will!

However why Ukrainian people prefers the representatives of left parties as deputies of the Parliament, who brake the reforms?

To answer this question and series of others we need to study transition on micro-level, in particular, behavior of individuals.

Worker behavior under different social-economic environments

Why is Japanese working time so long?

Akira Kawaguchi

Standard model

One of the most famous idea of Adam Smith is that the commonwealth of nations depends not from the quantity of gold, but on how productively and effectively a simple worker works.

Hence, the behavior of workers under different conditions, their reaction on incentives, stimulus, remuneration, taxes, social environment is the core of economic theory.

Recall one variant of a classical model, which describes worker's behavior. The main assumptions of the model are the following:

³⁵ *Kaneda, Tatsuo. Regime and People: Revival of A Small Country in Central Asia, Tokyo: Japan Institute of International Affairs (in Japanese), 1995.*

1. The individual's utility level depends on income and labor activity.

2. An individual can change his labor activity.

3. Wage rate for any unit of work is constant.

4. "Income-labor activity" combination conforms to the social security principles.

In this model, the worker chooses his or her income and labor activities in order to maximize the welfare. The model of labor supply can be written as

$$u(I, L) \xrightarrow{I, L} \max, \quad I \leq wL + I^0, \quad (I, L) \in \mathfrak{X};$$

where

w is the wage (or remuneration) rate;

I^0 is non-labor income;

I is the individual's total income;

L is the desired quantity of labor supplied;

$u(I, L)$ is the individual's utility function whose arguments are income and quantity of labor supplied;

\mathfrak{X} is the set of "labor activity — income" combinations which are in agreement with social security principle.

The model of labor supply can be represented in the following graph:

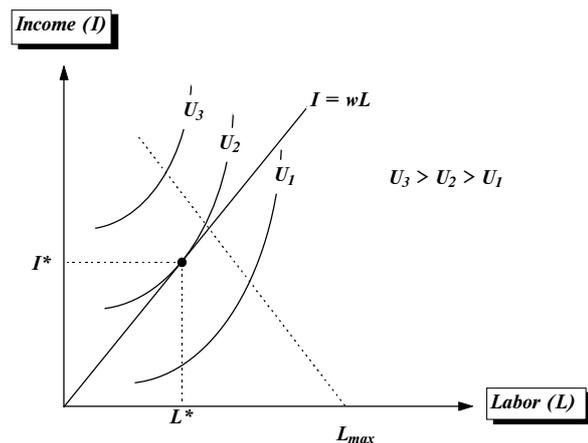


Figure 2. Equilibrium of individual worker without non-labor income

In Figure 2, the following notations were used:

L_{max} is maximum quantity of labor activity;

U_1, U_2, U_3, \dots are the indifference curves defined on the couples "Income — Labor activity"³⁶;

³⁶ Indifference curve contains the combinations of income and labor activity which yield equivalent or identical welfare level from the worker's point of view. The graph shows typical form of indifference curves, reflecting standard assumptions about preference of working individuals. Among them are the following:

1) a worker can choose the most preferable combinations "income — labor" from two possible;

2) a worker prefers to work less, and to earn more (axiom of monotony);

3) each additional unit of work activity requires more remuneration (raising of the marginal rate of substitute of income for labor).

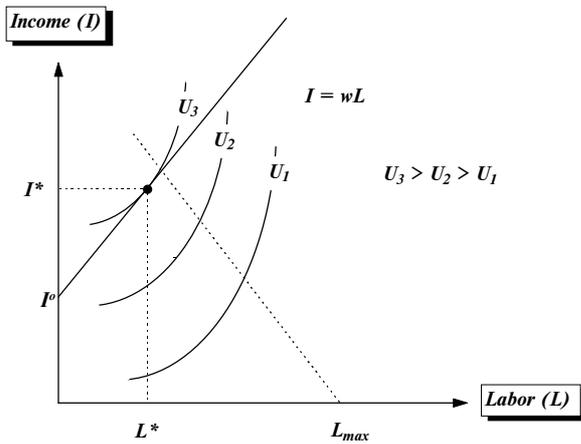


Figure 3. Worker equilibrium with non—labor income

L^* is the equilibrium labor supply;
 I^* is the equilibrium income.

Economic theory and applied economics have studied the reaction of a worker to different changes in remuneration, taxes, non—labor income, social—economic environment and so on. The Figure 3 represents the behavior of a worker if she/he receives non—labor income.

Non—labor income, subsistence income and behavior of worker

Labor economics proposed one well known conclusion about the behavior of worker. According to numerous theoretical and applied investigations when wage (remuneration) increases, then a labor supply increases to up certain value, and than decreases (see, Ashenfelter O. and Heckman J. J. ³⁷, Borjas G. J. and Heckman, J. J. ³⁸, Hausman J. A. ³⁹, Hicks J. R. ⁴⁰, Hyman D. N. ⁴¹ and others). This fact can be illustrated by the next graph (see Figure 4).

Untutored explanation of the form of the curve on the Figure 4 is that worker with small income is interested to earn more, but one with essential income is able to buy leisure, or equivalently, to work less.

Let us elaborate on the standard model by adding such the important parameter, as subsistence

In accordance with these assumptions the indifference curve U_3 contains more preferable “income — labor” combinations than U_2 , and, in turn, U_2 more preferable than U_1 .

³⁷ Ashenfelter, O., and Heckman, J.J., «The Estimation of Income and Substitution of Income and Substitution Effects in a Model of Family Labor Supply», *Econometrica*, 42:1, January 1974, pp. 73—86.

³⁸ Borjas, George J., and Heckman, James J., «Labor Supply Estimates of Public Policy Evaluation», in Working Paper NO. 299, Cambridge: National Bureau of Economic Research, November 1978.

³⁹ Hausman, Jerry A., Labor Supply, in Aaron, Henry J., Pechman, Joseph A., «How Taxes affect Economic Behavior», Washington, D.C.: The Brooking Institution, 1981, pp. 27—84.

⁴⁰ Hicks, J.R., «The Theory of Wages», MacMillan: London, 1932.

⁴¹ Hyman, David N., «Public Finance: A contemporary Application of Theory to Policy», 2nd Edition, Chicago: The Dryden Pres. 1987, pp. 211—216.

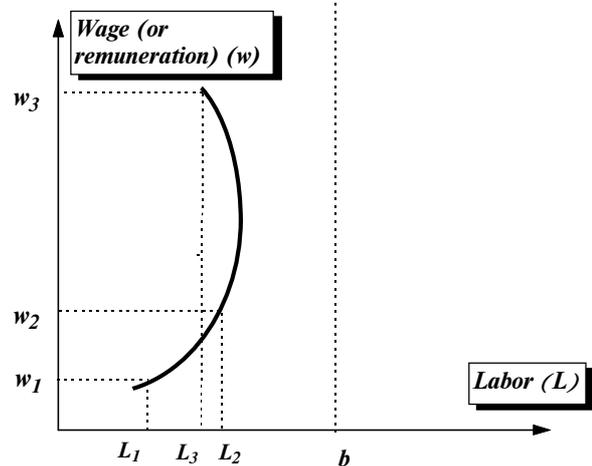


Figure 4. Typical dependence labor supply on wage (or remuneration)

income. Subsistence income refers to the minimal level of income which a worker must receive in order to survive.

Let L_{max} is the maximum quantity of labor supply, and I_{min} be the subsistence income. In this case the feasible set of “income — labor” combinations can be represented by the shaded area (Figure 5).

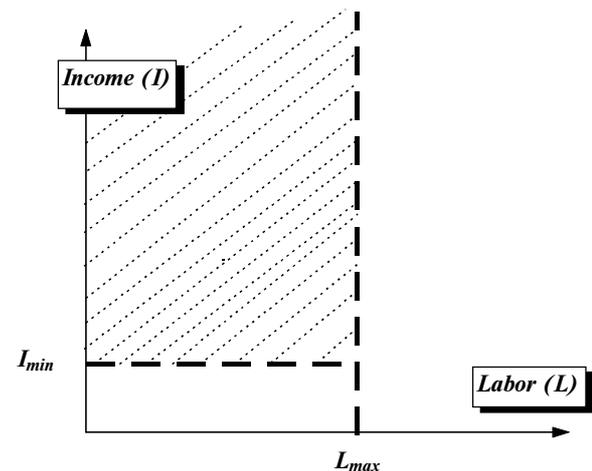


Figure 5. Feasible set in the case of the income restriction

Consider two principal cases dealing with non—labor income.

- I. Non-labor income is greater than the subsistence income;
- II. Non-labor income is less than the subsistence income.

The last case is shown on Figure 6.

The Figure 6 very clearly proves that *if subsistence income is greater than non-labor one, then the reducing of remuneration, in particular, wage, raises the quantity of labor supplied by the worker.*

This fact can be represented on Figure 7.

From our point of view, the behavior of worker represented in Figure 7 is unusual for developed market oriented country but is a distinctive feature

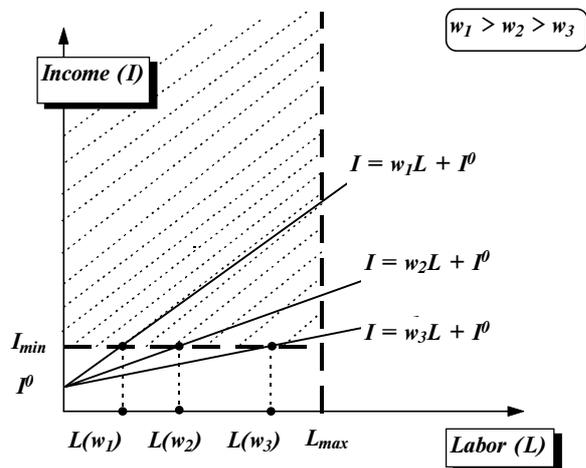


Figure 6. Labor supply and remuneration in the case when non—labor income is less than subsistence income

of countries with total state ownership and countries at the beginning of transition process. If some agent (the state) is a monopsonist of labor, then the worker loses the possibility to choose and change job. She/he must work more intensively to survive as the monopsonist reduces remuneration. I would like to emphasize two important features of total state ownership, which implies similar dependence of labor supply on remuneration. These are:

- 1) monopsony in the labor market, the absence of alternatives for workers;
- 2) the absence (or small amount) of non—labor income.

In developed countries, non-labor income for the majority of the population can be very substantial, because it can be income from ownership,

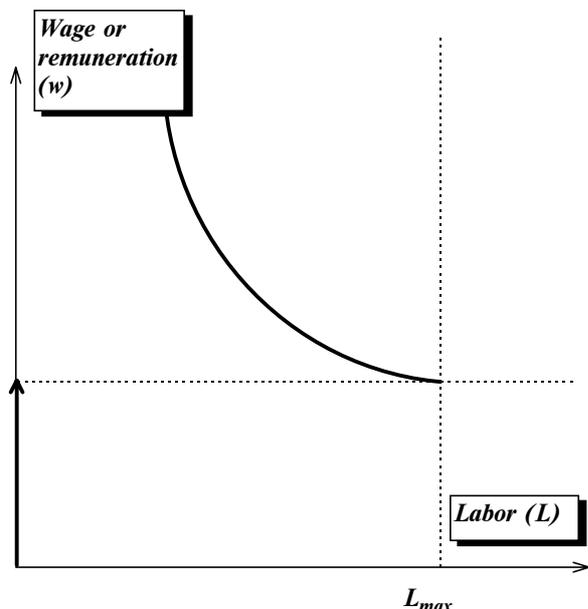


Figure 7. Labor supply dependence on wage (remuneration) in the case when non—labor income is less than subsistence income

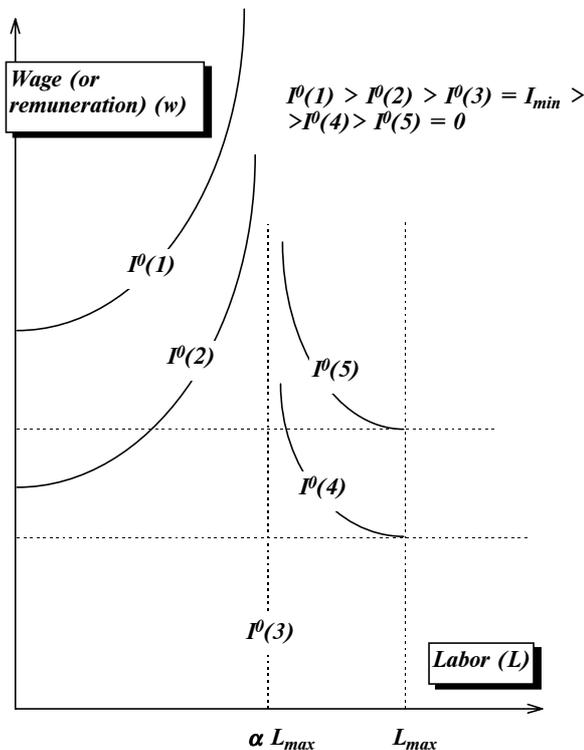


Figure 8. Dependence of labor supply on remuneration at different values of non—labor income ($I^0(1), I^0(2), \dots$)

subsidies, large pensions, etc. In the centrally planned and some transition countries, for instance, Ukraine, non-labor income is not able to afford workers modest living standards, consequently, they have to increase their labor activity in response to reduction in remuneration.

Comparative analysis of Labor supply for different values of non—labor income

Under very reasonable assumptions behavior of workers can be simulated, using some optimization problems⁴² (see, Appendix A. Worker behavior model incorporating Geary — Stone' utility function, Model, p. 22). One of results of simulation is reproduced in Figure 8.

Parameter α means the propensity to work, $1 - \alpha$ — the propensity to leisure (i.e., not work).

By the way, A. Kawaguchi⁴³ used two values for propensity to earn for “average” Japanese, i.e., 0.85 and 0.6. According to T. Kinoshita⁴⁴ the α for the average Japanese is equal 0.85.

⁴² Yastremsky O. A Comparative Analysis of Labor Supply and Welfare Level in Different Social-Economic Environments, *Ukrainian Economic Review*, 1996, v. II (3), Philadelphia, pp. 53—72.

⁴³ Kawaguchi, Akira. Why is Japanese working time so long?: Wage-working time contract models, *The Japanese Economic Review*, Vol. 47, No. 3, September 1996, pp. 251—270.

⁴⁴ Kinoshita, T. Rodo Jikan to Chingin no Keizigaku (Economics of Working Time and Wages, in Japanese), Tokyo : Chuo Keizaisha, 1990.

Remuneration for labor under socialism

Socialism refers to a system of the state ownership of capital. Few changes have taken place in Ukraine and other countries of the former USSR with respect to this fact. The opinion exists that political dictatorship and direct compulsion were the basis of this system. With regard to labor stimulation (which interests any system) the socialistic state had and has powerful economic levers based on the state's possession of jobs in the labor market which permits it to set monopsonistic wages. "Labor heroism", "enthusiasm" of the past years are explained, by among other reasons, low wage rates and the absence of other sources of income ($I^0 < a$ or $I^0 = 0$). The striking example of obliged labor heroism was described by Russian writer Alexander Soljenitstin in "One day of Ivan Denisovich" ("Один день Ивана Денисовича"). The prisoners tried to work hard because they were afraid of the reduction of food ration.

Tax policy under centrally planned economy and in the infancy of transition

Once again, consider Figure 6 (21 p.), and imagine that w means "net" remuneration after taxation. Suppose the simplest assumption that tax is given by

$$w = (1 - \gamma) \tilde{w},$$

where

γ is the proportional tax on labor income;

\tilde{w} is the remuneration for labor.

A rise in the tax rate has the same effect on labor activity as the reduction in remuneration, i.e., labor activity increases, because a worker must "eke out an existence".

This situation is possible under total state ownership (Centrally Planned Economy and the infancy of Transition). Tax income can be represented by Figure 9.

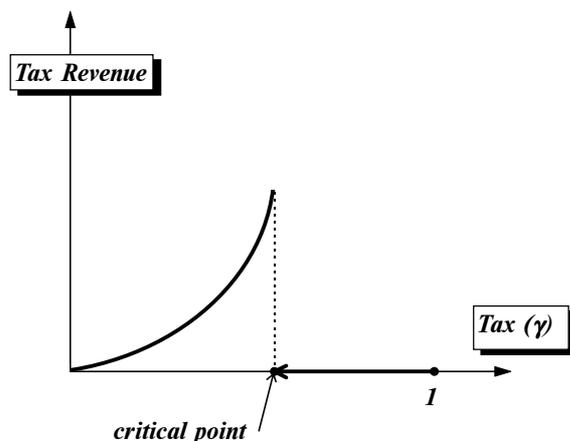


Figure 9. Tax Revenue if non-labor income is less than subsistence income

The form of tax income dependence on tax is essentially different in comparison with the well known Laffer curve. Spend attention must be given to the *critical point* on Figure 9. If the tax rate is greater than some critical value, the worker will not able to pay tax and, at the same time, earn her/his living.

Appendix A. "Worker behavior model incorporating Geary — Stone" utility function" contains the "Statement 2" (22 p.), which formally proves the form of tax income curve in Figure 9.

Worker behavior under group and total ownership incentives

Corporation: an ingenious device for obtaining individual profit without individual responsibility.

Ambrose Bierce

Les hommes ont pour l'égalité une passion ardente, insatiable, éternelle, invincible

A. de Tocqueville

An example

Consider an utopian situation of a joint activity society of workers. Each worker tries to earn some income, but income in society is distributed according to the Result Leveling Principle. This principle of remuneration for labor is more or less a typical feature of socialism experiments during different periods. This principle is manifested most clearly in R. Owen's New Harmony⁴⁵, Chinese communes, the military communism period and the initial period of Kolkhoz system in the USSR. (To our mind, leveling is a genetically inherent quality of socialism in general, but in more complex and whimsical forms).

To explain the Result Leveling Principle let us consider a simple example. Suppose a commune is made up of ten participants. Assume, during a day, each worker's earning is given as follows:

10, 5, 3, 15, 4, 11, 9, 8, 4, 5 (thousand yen).

According to the pure Result Leveling Principle, remuneration for each worker will be

$$(10 + 5 + 3 + 15 + 4 + 11 + 9 + 8 + 4 + 5)/10 = 7.4$$

This principle is also named (*pure*) egalitarian principle.

Let us assume that each worker worked for 8 hours. So, the hourly wage of each worker is given as follows

$$10/8 = 1.25, 5/8 = 0.625, 0.375, 1.875, 0.5, 1.375, 1.125, 1, 0.5, 0.625.$$

Suppose that the tenth worker decided to increase his income by working an additional hour (i.e., by working a total 9 hours in particular day). When the tenth worker worked only 8 hours, he

⁴⁵Robert Owen (1771—1825) one of Utopists who tried to do some socialist experiments, in particular, organizing the commune New Harmony. The incentives to work of the members of commune were characterized as wage-leveling principles. This experiment had have failure.

earned 7.4 (thousand yen). When she/he worked one additional hour, he would earn

$$(10 + 5 + 3 + 15 + 4 + 11 + 9 + 8 + 4 + (5 + 5/8))/10 = 7.4 + (5/8)/10 = 7.4 + 0.0625 = 7.4625$$

Hence, the tenth worker were to increase his labor activity by one hour he will earn an additional 62.5 yen instead of 625 = (5.000/8) yen while she/he would have earned if she/he were work individually.

Budget lines

Using the previous numerical example, the budget line for a worker can be constructed. Consider again the 10th worker. Her/his budget lines

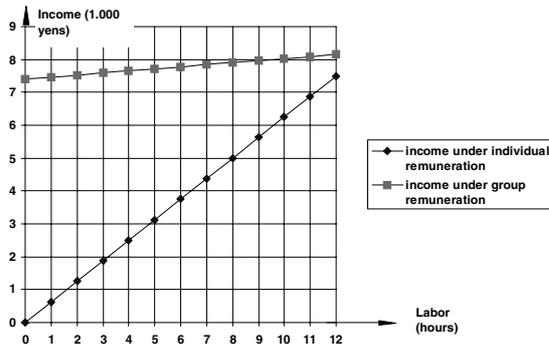


Figure 10. Worker income under individual and group remuneration

under individual and group incentives could be represented in Figure 10.

In general case the budget lines are shown in Figure 11, where q_s is ability of worker s to earn per one unit of time).

One line reflects consumed income dependence on labor activity for the worker s , who is working

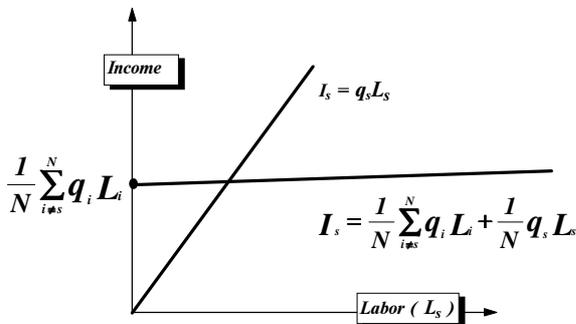


Figure 11. Budget lines under individual and group remuneration

individually. Other line — for worker, who works under the Results Leveling System.

Figure 11 shows in relief that each additional unit of labor activity under the Result Leveling System “drowns” in the big caldron of commune. So, the preliminary analysis hints that additional labor efforts are not profitable from individual welfare point of view.

Worker behavior under group remuneration

See the next figure (Figure 12).

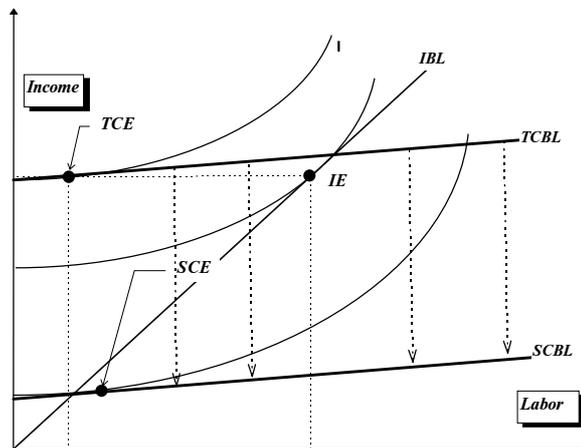


Figure 12. Work shirking under Results Leveling System (*IBL* — individual budget line, *TCBL* — tactic budget line of individual, who works in commune (under the Results Leveling System), *SCBL* — strategic budget line of individual, who works in commune, *IE* — individual equilibrium, *TCE* — tactic equilibrium of individual, who works in commune, *SCE* — strategic equilibrium of individual, who works in commune).

The individual forecasts to diminish her/his labor activity in the commune without essentially diminishing her/his income while essentially increasing her/his welfare (moving from the equilibrium point *IE* to the point *TCE*, which is located on the budget line *TCBL*).

However, each individual is similar minded, and the labor activity of each is decreasing. The result of non cooperative actions of individuals in commune is to shift the budget line *TCBL* to *SCBL*. This is represented by a move from *TCE* to *SCE*.

So, the labor activity in total state sector implies a total shirking.

Labor supply depending on number of workers in group

Using the graphical illustrations, the previous item grounds principal possibility of shirking under group incentives (state ownership). Theoretical results of studying of workers behavior under group incentives gives the opportunity to show labor supply dependence on the number of workers in commune (see Statement 5, 22 p.).

Let us consider N identical employees working under group incentives. The Figure 13 illustrates a desire of workers to shirk the work under the Results Leveling System.

If system of workers’ preferences satisfies certain very natural assumptions (see footnote 36, p. 12), it is possible to prove some formal results dealing with peculiarities of workers behavior under group (Results Leveling System). The AppendixB. “Workers behavior under group (Results Leveling System) incentives” contains these results.

The main sense of the Statement 3 (22 p.) and Statement 4 (22 p.) is proving that the level of shirking increases in state sector as the number of workers community increases.

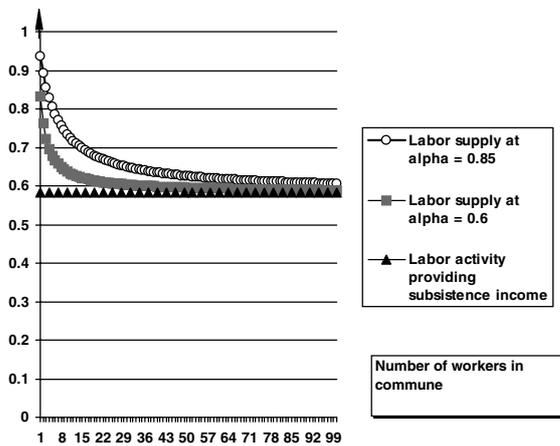


Figure 13. Labor supply depended on number of workers in group (1 is maximum of labor activity)

Also the Figure 13 illustrates that the labor supply of each worker strives to minimal level (level providing a subsistence income, that is, subsistence income divided on the ability to earn ⁴⁶), if the number of workers increases.

The model of non state (alternative) sector suppression

Similar effects are well known in the theory of public economics, club theory, firm theory (see, Nalbantian, H. R. and Schotter, A. ⁴⁷, Nalbuff, B. and Sansing, R. ⁴⁸, Ray, D. and Ueda, K. ⁴⁹, Barham, V.; Boadway, R.; Marchand M. and Pestieau, P. ⁵⁰, Harsanyi, J. C. ⁵¹ and the rest). Shirking under group incentives is one result of the theory of non cooperative games by J. Nash (see, Nash, J. F. ⁵²). J. Nash proved that the Nash equilibrium is not Pareto optimal.

My result allows for investigation of *level of shirking subject to other parameters*. For instance, some our formulas give an opportunity to establish *level of shirking* according to the number of workers in commune, subsistence income, income from alternative (non state) sector.

⁴⁶ In our case subsistence income is 175, and the ability to earn is 300. So, the minimal level of labor supply providing the subsistence income is $175/300 = 0.5833$

⁴⁷ Nalbantian, H. R. and Schotter, A. Productivity Under Group Incentives: An Experimental Study, American Economic Review, June 1997, 87 (3), pp. 314–341.

⁴⁸ Nalbuff, B. and Sansing, R. The Rationally Shrinking Union, Economics and Politics, Vol. 8, March 1996, No 1, pp. 51–59.

⁴⁹ Ray, Debray and Ueda, Kaoru. Egalitarianism and Incentives, Journal of Economic Theory, Volume 71, Number 2, November 1996, pp. 324–348.

⁵⁰ Barham, V.; Boadway, R.; Marchand M. and Pestieau, P. Volunteer work and club size: Nash equilibrium and optimality, Journal of Public Economics, volume 65, No 1, July 1997, pp. 9–22.

⁵¹ Harsanyi, J. C, Rational Behavior and Bargaining Equilibrium in Games and Social Situations, Cambridge University Press, 1988, p. 314.

⁵² Nash, J.F., «Non-cooperative Games», Annals of Mathematics, 54, 1951, pp. 286–295.

The results described above can also be used to estimate the effect of privatization.

There are numerous investigations in which authors studied labor productivity under group incentives, and methods of elimination of shirking and free riding (see, Nalbantian, H. R. and Schotter, A. ⁵³, Calvo, G. A. and Wellisz, S. H. ⁵⁴, Chen, Y. and Plot, C. R. ⁵⁵). Among the proposed methods are:

- 1) Revenue Sharing;
- 2) Target Based Schemes Forcing Contracts;
- 3) Profit Sharing;
- 4) Gainsharing;
- 5) Tournament-Based Schemes: Competitive Teams;
- 6) Individualistic Schemes: Monitoring (see, Nalbantian, H. R. and Schotter, A. ⁵⁶);

1) The Groves-Ledyard mechanism (see, Chen, Y. and Plot, C. R. ⁵⁷).

I have studied a special case fighting against shirking under centrally planned economy and proposed an appropriate method. This method is important, because it gives an opportunity to evaluate a more realistic initial point of the Transition — centrally planned economy.

Let us consider the Center, which tries to maximize tax income, and community of workers under Results Leveling System.

The next graphs show dependence of the Center tax income on proportional tax rate.

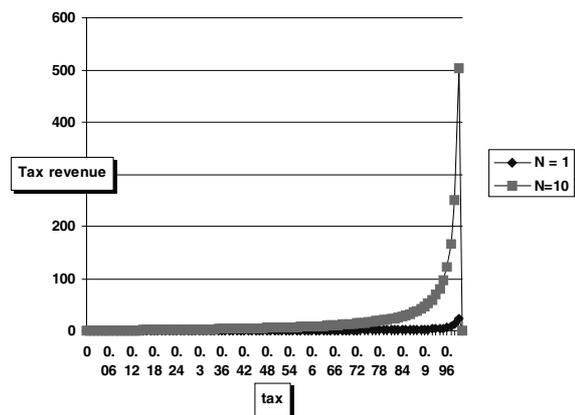


Figure 14. The Center tax income (the income from non state sector does not exist)

⁵³ Nalbantian, H. R. and Schotter, A. Productivity Under Group Incentives: An Experimental Study, American Economic Review, June 1997, 87 (3), pp. 314–341.

⁵⁴ Calvo, G. A. and Wellisz, S. H. Supervision, Loss of Control, and the Optimum size of the Firm, Journal of Political Economy, October 1978, 86 (5), pp. 943–952

⁵⁵ Chen Y. and Plot C.R. The Groves-Ledyard mechanism: An experimental study of institutional design, Journal of Public Economics, vol. 59, No 3, March 1996, pp. 335–364.

⁵⁶ Nalbantian, H. R. and Schotter, A. Productivity Under Group Incentives: An Experimental Study, American Economic Review, June 1997, 87 (3), pp. 314–341.

⁵⁷ Chen, Y. and Plot C. R. The Groves-Ledyard mechanism: An experimental study of institutional design, Journal of Public Economics, volume 59, No 3, March 1996, pp. 335–364.

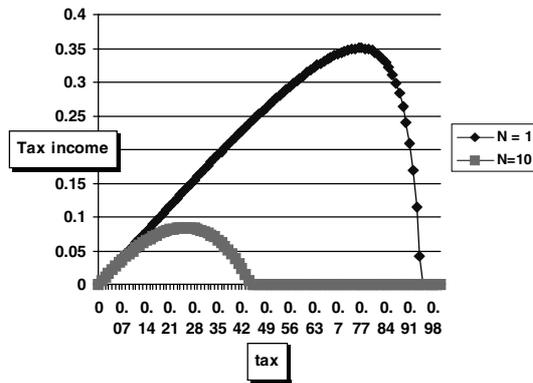


Figure 15. The Center tax revenue (the income from non state sector is greater than subsistence income)

The Figure 14 and Figure 15 imply two very important cases for the Center:

- 1) income from non state sector is greater than subsistence income ($I^0 > I_{min}$);
- 2) income from non state sector is less than subsistence income ($I^0 < I_{min}$).

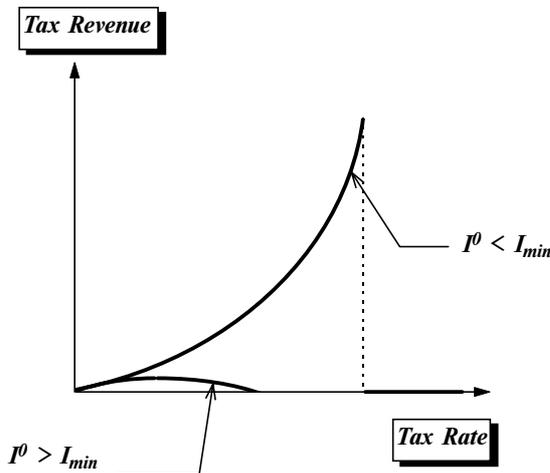


Figure 16. The Center tax revenue if non state income is less or greater than subsistence income

Analysis tells us that, for large N tax income at $I^0 > I_{min}$ is much less than at $I^0 < I_{min}$. Dependence of the Center Profit (Tax Income) on the level of non state sector income is shown on the Figure 17.

So, self-interested Center is not interested non state income above subsistence income. If non state income is greater then subsistence income, and number of workers is sufficiently large, then shirking in state sector transforms into dominating strategy, and the self-interested Center will lose a livelihood.

One possible way for the Center to survive is to depress non state income of workers.

Hence, the crucial assumption of our analysis is the possibility of the Center to destroy the alternative, i.e. non state sector. In different periods of the Soviet system existence the Center used different methods of non state sector suppression. Let us make

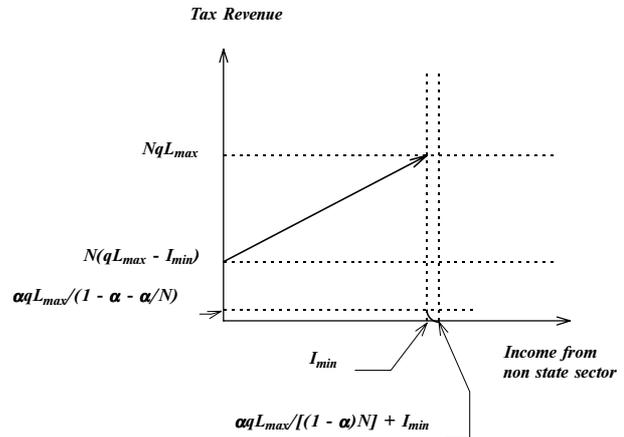


Figure 17. Tax Revenue and Income from non state sector

the simplest assumption, that the Center can spend some part of its profit to suppress non state sector, or

$$I(c, \xi) = I^0 - Kc + \xi c \quad (3)$$

where

$I(c, x)$ is level of non state sector income;

c is state expenditures used for non state sector suppression (KGB expenditures);

K is the reduction of non state sector income per one unit of the KGB expenditures, or other words, marginal expenditures of non—state sector suppression

ξ is random variable.

Using the assumption (3) and supposing that the Central Planner is neutral to risk, the problem of the Center maximizing its expected utility profit was formulated (see Appendix C. “The model of non state (alternative) sector suppression”, 23 p.).

The problem of optimal suppression of non state sector has been studied under different combinations of parameters. For the Center the most important case is $I_{min} < I^0$, that is income from non state sector is greater than the subsistence income. At this case without suppression of non state sector the Center

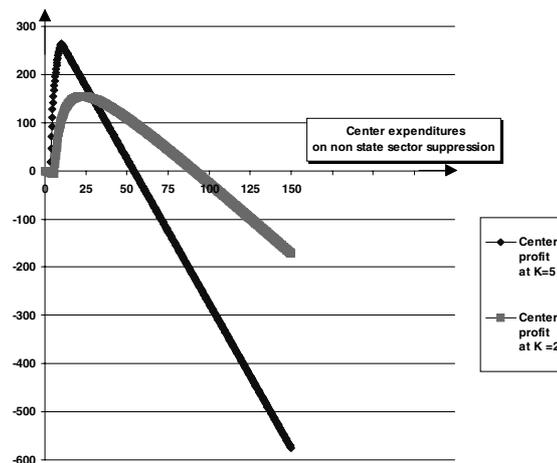


Figure 18. The Center Expected Profit, the Possibility of excess expenditures ($c > 54$) on non state sector suppression ($I_{min} = 175, I^0 = 200, L_{max} = 1, q = 300$)

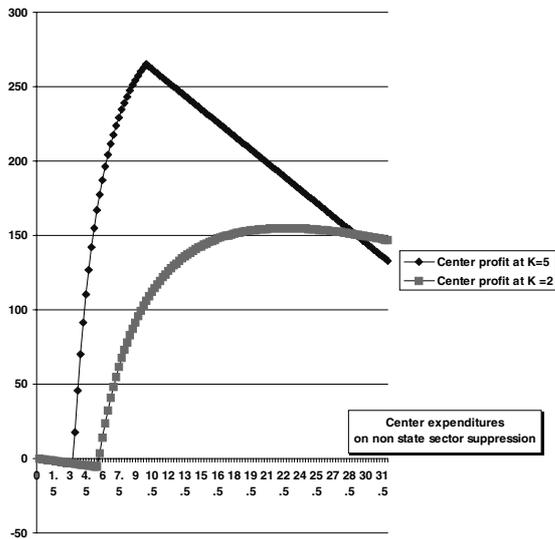


Figure 19. The Center Expected Profit ($I_{min} = 175, I^o = 200, L_{max} = 1, q = 300$)

can not survive, because shirking of state sector destroys the possibility to collect the tax.

Under the assumptions made above, it is possible to calculate Expected Center Profit (see Figure 18 and Figure 19).

The effectiveness of suppression of non state sector essentially depends on the parameter K , which can be interpreted as necessary expenditures for reducing non state sector income. Figure 18 and Figure 19 illustrate this fact. They show that with a more effective suppression apparatus, the optimum of the Expected Profit Center is greater.

Figure 18 also tells us that the excess expenditure on suppression apparatus can destroy the Center Profit ($c > 54$).

Figure 18 and Figure 19 show that there exist values of parameters (expenditures of non state sector income suppression per unit, level of uncertainty, non state sector income) at which the Results Leveling System can survive. Similarly, there exist values of parameters at which this System is not able to survive, and the Expected Center Profit is negative. The latter case is shown in the next figure.

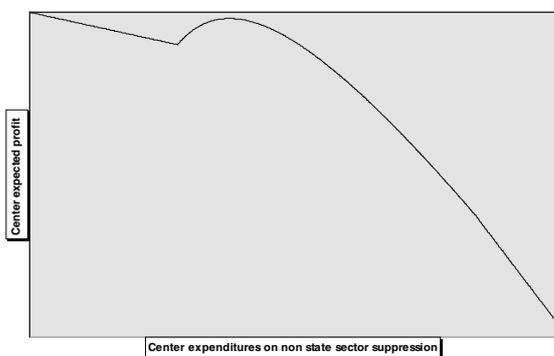


Figure 20. The Results Leveling System is not able to survive ($I_{min} = 175, I^o = 700, L_{max} = 1, q = 300$)

The main theoretical conclusion from the above model of the Results Leveling System including expenditures on non state sector suppression is the following: in spite of strong workers' incentives to shirk in total state sector, the Results Leveling System can survive under some conditions. The clearest case of this is when $I^o < I_{min}$, that is, subsistence income is greater than non state sector (alternative sector) income. In opposite case, $I^o > I_{min}$ (that is, non state sector income is greater than subsistence income) the System is fateful if it does not undertake effective measures to suppress the non state sector. Lastly, if the difference between the non state sector income and subsistence income, and expenditures on suppression of non state sector are not very big, then the Results Leveling System can survive.

Applications of the theoretical results

The success of Left Parties during the March of 1998 election to Ukrainian Parliament

In accordance with forecast of Ukrainian and foreign experts the left parties achieved essential success during last election to the Ukrainian parliament (see Table 4, p. 7).

The results are discouraging and enigmatical. They seem to suggest that, the Ukrainian people were very happy and satisfied with the socialism system? Quite the opposite picture emerges from official data which indicate that the Ukrainians were the ones who suffered the most from the socialist system.

Using theoretical models, let us try to understand the magnetism of socialism slogan for simple people, in particular for Ukrainian people.

Standard assumptions about the behavior of workers found that, for some individuals, the participation in commune is profitable. Really, see on the Figure 12 (15 p.). It can also illustrate not only the shirking the total state sector, but also the *tactic magnetism and strategic disutility of socialism*.

At the first blush, the benefit of participation in the Results Leveling System for the individual is obvious: working less, receiving almost the same income (moving from the equilibrium point IE to the point TCE , which is located on the budget line $TCBL$). However, this commune advantage is only an illusion because each individual is similar minded, and the labor activity of each is decreasing (a move from TCE to SCE). The System is degrading, and the welfare of each participants of commune is decreasing. The participation in the Results Leveling System from strategic (long — run) point view is destructive for each worker.

Figure 12 (15 p.) illustrates the trap of socialism slogans: short-run advantages and long-run disutility. Unfortunately, the significant part of

Ukrainian voters are in the trap of illusions of short-run advantage.

Next question which arises is why Ukrainian people do not realize their own long-run interests. This question is really in the crux of understanding the Ukrainian transition process. One preliminary explanation is that the mentality of soviet people can not be transformed immediately, and soviet consumer and worker lost an ability to understand their strategic and long-run interest because they suffered from the different factors. Among these are:

- 1) parallels markets;
- 2) rationing;
- 3) pervasive queuing;
- 4) highly uncertain value of money resulting from the fact that consumers could not accurately predict when they would have to turn to the second economy for basic purchases ⁵⁸.

The infancy of the Transition

The Soviet system collapse

The Transition from Centrally planned to Market economy is mainstream of contemporary economic thought. According to historical point of view the Transition is one of the links in the chain:

*Centrally Planned Economy — Collapse of the
Centrally Planned Economy — Transition —
Market Economy.*

Numerous economists have tried to describe and explain the nature of this process from different point of view using different methods of description and analysis (see Yujiro Hayami ⁵⁹, Gisela Meyer Escoa ⁶⁰, Jan Adam ⁶¹, Marie Lavigne ⁶², Bryan W. Roberts and Alvarado Rodriguez ⁶³, John Gibson and Philip Hanson ⁶⁴, Alla Fridman ⁶⁵, Robert

⁵⁸ Acharya A., Spagat M. A General Model of the Soviet Consumer, *Journal of Comparative Economics*, 1995, 20, 3, pp. 302—315.

⁵⁹ Hayami, Yujiro. Japan in the new world confrontation: a historical perspective, *The Japanese Economic Review*, Vol. 46, No. 4, December 1995, pp. 351—357.

⁶⁰ Escoa, Gisela Meyer. The Demise of Soviet Industry: A Regional Perspective, *Journal of Comparative Economics*, Volume 21, Number 3, 1995, pp. 336—352.

⁶¹ Adam, Jan. Why did the Socialist System Collapse in Central and East European Countries? The case of Poland, the Former Czechoslovakia, and Hungary. New York: St. Martin's Press, 1996. xiii + 234 p.

⁶² Lavigne, Marie. Russia and Eastern Europe: Is Transition Over?, *Journal of Comparative Economics*, Volume 23, Number 1, 1996, pp. 20—37.

⁶³ Roberts, Bryan W. and Rodriguez, Alvarado. Economic Growth under a Self-Interested Central Planner and Transition to a Market Economy, *Journal of Comparative Economics*, Volume 24, Number 2, 1997, pp. 121—139.

⁶⁴ Gibson, John and Hanson, Philip, Eds. Transformation from Below: Local Power and the Political Economy of Post-Communist Transitions. Brookfield, VT: Edward Elgar, 1996. ix + 330 pp.

⁶⁵ Fridman, Alla. Privatization and Price Liberalization: Comparative Analysis, *Journal of Comparative Economics*, Volume 24, Number 3, 1997, pp. 313—334.

C. Allen ⁶⁶, Mathias Dewatripont and Gerard Roland ⁶⁷, Olivier Blanchard ⁶⁸, Jeffrey D. Sachs ⁶⁹, S. Fisher, R. Sanay, C. Vegh ⁷⁰, В. И. Аркин, А. Д. СЛАСТНИКОВ ⁷¹, Anders Aslund ⁷² and many others).

According to our investigations, a Centrally planned economy can be characterized by two crucial features:

- 1) total shirking in state sector, and
- 2) specific methods of suppression of non—state sector (which is alternative to state sector).

From our point of view the collapse of Soviet system was not and is not puzzling. The puzzle was and continues to be the following: “Why did this System exist so long?”

The method of shirking suppression, which is described above, explained why the Centrally planned economy (of Soviet type) has survived nearly 70 years.

The suppression of non state sector as method of a fight against total shirking is useful for understanding the Soviet system collapse. After Helsinki agreement a large part of soviet people received legal opportunity to leave the Soviet system by emigration. In the end of the nineties the 4th paragraph of the Soviet Constitution was delited. This paragraph constitutes the leading role of the Communist party in life of society. The results of these events were:

I. greater availability of alternative to state sector;

II. the Central self-interested planner lost the possibility to suppress non state sector using such apparatus as communist party and KGB.

The Soviet Centrally planned economy was fateful.

Output falling down

During the first years after the collapse of the Centrally planned economy the state sector continues to dominate, although the methods of

⁶⁶ Allen, Robert C. Agriculture Marketing and the Possibilities for Industrialization in the Soviet Union in the 1930s., *Explorations in Economic History*, Volume 34, Number 4, October 1997, pp. 387—410.

⁶⁷ Dewatripont, Mathias and Roland, Gerard. The Design of Reform Packages under Uncertainty, *American Economic Review*, December 1995, 85 (5), pp. 1207—1223.

⁶⁸ Blanchard, Olivier. Theoretical Aspects of Transition, *American Economic Review*, May 1996, 86 (2), pp. 117—122.

⁶⁹ Sachs, Jeffrey D. The Transition at Mid Decade, *American Economic Review*, May 1996, 86 (2), pp. 128—133.

⁷⁰ Fisher S., Sanay R., Vegh C. Economies in Transition: The beginnings of Growth, *American Economic Review*, May 1996, 86 (2), pp. 229—233.

⁷¹ Аркин В. И., Слостников А. Д. Равновесная модель перехода от централизованной экономики к конкурентному рынку, *Экономика и математические методы*, Том 30, вып. 3, 1994.— 102—116.

⁷² Aslund, Anders; editor. Russian economic reform at risk, London: Pinter, 1995. Pp. 212.

suppression of shirking were soon after exhausted. This can be used to explain the “stylized fact” that the production diminished (i.e., output fell during the first years of the transition.

(Hyper)Inflation

One of very important and unpleasant features of transition economies is inflation and, in some cases, hyperinflation. Ukraine suffered from hyperinflation during 1992–95 years. The main reasons of hyperinflation are:

- inactivity of government in restructuring of enormous large state sector;
- traditional labor forces shirking from work in state sector;
- development of democracy and the breakdown of the suppression of non state sector as method of a fight against total shirkin;
- government artificial methods of “pouring oil on troubled waters” among different groups of employees in state sector using salary increasing by expand money supply by printing machine.

Conclusions

The results of our research can be summarized as follows.

1. Microeconomic consequences of macro-decisions are very important for understanding of transition process.
2. Behavior of micro units, in particular, of workers could not be changed immediately. One of the reasons is inertia, traditionalism and adherence to metier; another — initial conditions of labor activity.
3. Subsistence, non labor income and income from non state sector (alternative to state sector) play crucial role in behavior of workers under Centrally planned economy and Transition.

4. The sunset of Centrally planned economy and the infancy of the Transition entail the existence of large strata of people on the margin of poverty and survival.

5. So, their behavior differs from the behavior of workers in developed countries with stable economies.

6. The crucial peculiarities of initial point of the Transition, Centrally planned economy, are:

- i) total shirking in state sector, and
- ii) specific methods of suppression of non—state sector (which is alternative to state sector).

7. The self-interested Center is not able to survive without specific methods of suppression the alternative to state sector.

8. Democracy development disables the methods of non-state sector suppression. At the same time, economy is not restructured to the market style. So, output falling down is unavoidable features of the first stages of the infancy of Transition.

9. Governments (state administrations) without statehood experience (for instance, Ukrainian government, parliament, and state administration) do not possess long-run vision and, engendering inflation and hyperinflation, try to organize illusion of incentives for different sector of archaic state economy.

10. People of transition countries without statehood traditions also are not accustomed to long-run vision of their own interests. So, success of leftist parties, which promise government support for all comers, is very possible.

11. Main problems for contemporary Ukraine are formation of own statehood, national consciousness and long-run vision engrafting in feeling of people and state administration.

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Appendix A. Worker behavior model incorporating Geary - Stone' utility function

Model

$$u(I, L) = (I - I_{min})^\alpha (L_{max} - L)^{1-\alpha} \rightarrow \max,$$

$$I \leq (1 - \gamma)wL + I^0,$$

$$I \geq I_{min}, 0 \leq L \leq L_{max}, \tag{4}$$

where
I is the individual's total income (variable);
L is the desired quantity of labor supplied (variable);
w is the wage rate or remuneration level;
I_{min} is the subsistence income;
L_{max} is the maximum level of labor activity;
I⁰ is the non-labor income;
u(I, L) is the individual's utility function, whose arguments are income and quantity of labor supplied;
α is the propensity to earn;
γ is the tax rate on labor income.
 The solution of the model (4) at *γ* = 0 is characterized entirely by

Statement 1⁷³

If

$$L_{max} w + I^0 < I_{min}, \tag{5}$$

then problem (4) at has not feasible solution.

If

$$L_{max} w + I^0 = I_{min}, \tag{6}$$

then

$$L^* = L_{max}, I^* = I_{min}.$$

if

$$L_{max} w + I^0 > I_{min}, \tag{7}$$

then

$$L^* = \max \left\{ 0, \alpha L_{max} - (1 - \alpha) \frac{I^0 - I_{min}}{w} \right\} \tag{8}$$

Statement 2

Let the inequality (7) be fulfilled. The maximum proportional tax rate is

$$\min \left\{ 1, 1 - \frac{I_{min} - I^0}{L_{max} w} \right\}$$

and

$$L(\gamma) = \max \left\{ 0, \alpha L_{max} - (1 - \alpha) \frac{I^0 - I_{min}}{(1 - \gamma)w} \right\} \tag{9}$$

where *(L(γ), I(γ))* is the solution of problem (4) that depends on *γ*. The proof of the statement 2 follows immediately from statement 1, if we let *w* *(1 - γ)w̃*.

Appendix B. Workers behavior under group (Results Leveling System) incentives

Formal model

The Pure Result leveling system can be described by system of individual utility functions:

$$U_s(L_1, \dots, L_N) = u_s \left(\frac{1}{N} \sum_{i=1}^N q_i L_i, L_s \right) \tag{10}$$

where
L_s is labor supply of worker *s*,
q_s work ability of worker *s* per one unit of time.
 According to (10) individual income is some "simple" average of total product of community.

An important peculiarity of the (10) is that the result (i.e., output) is common for each worker, but labor efforts are individual.

The nature of total state ownership is reflected by the next crucial assumption that the equilibrium of workers with utility function (10) is described by a non cooperative game (i. e., by the Nash equilibrium). So, if *ℳ_s* is feasible set of labor supply for worker *s*, then equilibrium is defined by the following relation: *U_s(L₁^{*}, ..., L_{s-1}^{*}, L_s^{*}, L_{s+1}^{*}, ..., L_N^{*}) ≥ U_s(L₁^{*}, ..., L_{s-1}^{*}, L_s, L_{s+1}^{*}, ..., L_N^{*})*

$$\tag{11}$$

for *L_s ∈ ℳ_s, L_s^{*} ∈ ℳ_s* and for each *s = 1, ..., N*.

For worker *s*, *L_s^{*}* is the best strategy (i.e., will give at least as high *u* as *L_s*), taking into consideration the behavior (strategy) of other workers.

Some modifications of the model (10)-(11) are also possible. For instance, model with non labor income.

Study *r*-replica of community of workers with next labor abilities and utility functions:

$$q_1^1, \dots, q_N^1, u_1^1, \dots, u_N^1;$$

$$q_1^2, \dots, q_N^2, u_1^2, \dots, u_N^2,$$

.....,

$$q_1^r, \dots, q_N^r, u_1^r, \dots, u_N^r$$

where *q_s^t = q_s* and *u_s^t = u_s* for all *t = 1, ..., r*.

Consider the function,

$$U_s(L_1, \dots, L_N) = u_s \left(\frac{1}{N} \sum_{i=1}^N q_i L_i, L_s \right)$$

where *q_s > 0* *∀ s*, and the problem

$$U_s(L_1, \dots, L_N) =$$

$$= u_s \left(\frac{1}{N} \sum_{i=1}^N q_i L_i, L_s \right) \xrightarrow{0 \leq L_i \leq L_{max}^1, \dots, 0 \leq L_N \leq L_{max}^r} \max(\text{Nash})$$

⁷³ Yastremsky O. A Comparative Analysis of Labor Supply and Welfare Level in Different Social-Economic Environments, *Ukrainian Economic Review*, 1996, v. II (3), Philadelphia, pp. 53—72.

Statement 3

Let $u_s(I, L) \forall s$ be

- (i) defined on the set $\{(I, L): I \geq 0, 0 \leq L \leq L_{max}\}$;
- (ii) is a concave (pseudo-concave) function $\forall s$;
- (iii) is a continuously differentiable function $\forall s$;

$$(iv) \left. \frac{\partial}{\partial I} u_s(I, L) \right|_{I=0, L_s=0} > 0; \left. \frac{\partial}{\partial L_s} u_s(I, L) \right|_{I=0, L_s=0} < 0$$

Let r increase. Then r exists for which $L_1^*, \dots, L_{rN}^* = 0$ are the Nash equilibrium.

Main sense of statement is the proof of work shirking in state sector.

Other variants of statement 3 are possible.

For instance, main result remains in force not only for the Pure Results Leveling System, but also for the Fair Results Leveling System, where equal share

I/N is changed into fair share c_s . One of possible way of “fair” share definition is $c_s = \frac{q_s}{\sum_{i=1}^N q_i L}$.

Statement 3 is not true for some commonly used utility functions, for example for Stone — Geary utility functions because the latter contains essential goods. Statement 4 gives an opportunity to introduce “aversion” to state sector for this type of utility functions.

Consider indifference curve

$$u(I, L) = u,$$

and the implicit function $I(L, u)$. Together they define the following equation:

$$u(I(L, u), L) = u.$$

Statement 4

Let $u(I, L)$ be

- (i) defined on set $U = \{(I, L): I \geq 0, 0 \leq L \leq L_{max}\}$;
- (ii) concave (pseudo-concave) on the set U ;
- (iii) continuously differentiable $\forall I > 0$;

(iv) non-decreasing in I and non-increasing in L ; strictly increasing in I and strictly decreasing in $L \forall I > 0$ income is an essential good, that is $u(I, L_{max}) > u(0, 0) \forall I > 0$;

(v) $MRS_{L,L}(0, u) = I_L'(0, u)$ increases with to u .

If $r \rightarrow \infty$, then there are the subsequence $u_s^{r_i} \rightarrow 0$, where $u_s^{r_i}$ is level of the worker s utility in the Nash equilibrium of the r replica community.

Other words, Statement 4 is proving that the level of shirking increases in state sector as the number of workers community increases.

The proof of Statement 3 and Statement 4 are omitted. The author is willing to demonstrate their at sight.

Statement 5

One of instructive particular case of Result Leveling System uses Stone—Geary utility function. This utility function is widespread in theoretical investigations and practical applications. See, for instance, the article by Kawaguchi A. ⁷⁴

If all workers are equal, labor activity of each is

$$L = \frac{I - \alpha}{I - \alpha + \frac{\alpha}{N}} \cdot \frac{I_{min} - I^0}{(I - \gamma)q} + \frac{\alpha / N}{I - \alpha + \frac{\alpha}{N}} L_{max} \quad (12)$$

Statement 6

Let us consider the Center, which tries to maximize tax income, and community of workers under Results Leveling System. In this case the (12) implies tax income of the Central Planner (Center) is

$$TI(\gamma) = N\gamma\mathcal{L}(\gamma) = \gamma \left[\frac{\alpha}{I - \alpha + \frac{\alpha}{N}} L_{max} - \frac{(I - \alpha)N}{I - \alpha + \frac{\alpha}{N}} \cdot \frac{I^0 - I_{min}}{(I - \gamma)q} \right] \quad (13)$$

Appendix C. The model of non state (alternative) sector suppression

See the (13). It is possible to analyze the Center behavior using this equation. If $I^0 > I_{min}$, then

$$\gamma^* = 1 - \sqrt{N \frac{I - \alpha}{\alpha} \cdot \frac{I^0 - I_{min}}{qL_{max}}}$$

and

$$TI(\gamma^*) = \left(1 - \sqrt{N \frac{I - \alpha}{\alpha} \cdot \frac{I^0 - I_{min}}{qL_{max}}} \right) \left(\frac{\alpha}{I - \alpha + \frac{\alpha}{N}} L_{max} q \right) - N \frac{I - \sqrt{N \frac{I - \alpha}{\alpha} \cdot \frac{I^0 - I_{min}}{qL_{max}}}}{\sqrt{N \frac{I - \alpha}{\alpha} \cdot \frac{I^0 - I_{min}}{qL_{max}}}} \left[\frac{(I - \alpha)}{I - \alpha + \frac{\alpha}{N}} (I^0 - I_{min}) \right] \quad (14)$$

In opposite case,

$$\gamma^* = 1 - \frac{I_{min} - I^0}{L_{max} q}$$

and

$$TI(\gamma^*) = N(L_{max} q + I^0 - I_{min}) \quad (15)$$

Abecedarian analysis tells us that, for large N tax income at $I^0 > I_{min}$ is much less than at $I^0 < I_{min}$. Dependence of the Center Profit (Tax Income) on

⁷⁴ Kawaguchi, Akira. Why is Japanese working time so long?: Wage-working time contract models, The Japanese Economic Review, Vol. 47, No. 3, September 1996, pp. 251—270.

the level of non state sector income is shown on the Figure 17 (18 p.).

Hence, assuming N is sufficiently large and taking the assumption

$$I(c, \xi) = I^0 - Kc + \xi c$$

into account, we can express the Center Profit as follows

$$CP(c, \xi) = \begin{cases} -c & , c\xi \geq I_{min} - I^0 + Kc \\ qL_{max} - A - Kc - c + \xi c, & c\xi < I_{min} - I^0 + Kc \end{cases}$$

Suppose that the Central Planner is neutral to risk. The problem of the Center is to maximize its expected utility profit, i.e.,

$$f(c) = E[CP(c, \xi)] \xrightarrow{c \geq 0} \max \tag{16}$$

The solution of (16) depends on the distribution of random variable ξ . Let us make the simplest assumption, that the ξ has the uniform distribution within the interval $[-\delta, \delta]$ when value δ can be interpreted as level of uncertainty.

It is possible to find analytical formula for equilibrium expenditures (c^*) on non state sector suppression. If $I_{min} < I^0$, $K > \delta$, then

$$c^* = \sqrt{\frac{(I_{min} - I^0)(I_{min} - I^0 - 2qL_{max})}{4\delta + (\delta + K)^2}}$$

Using different combinations of parameters the problem (16) has been studied. For the Center the most interesting case is $I_{min} < I^0$. Without suppression of non state sector the Center can not survive, because shirking of state sector destroys the possibility to collect the tax.

The Center Expected Profit dependence on the expenditures on suppression of non state sector is shown on Figure 21 and figure at different values of K and non state income.

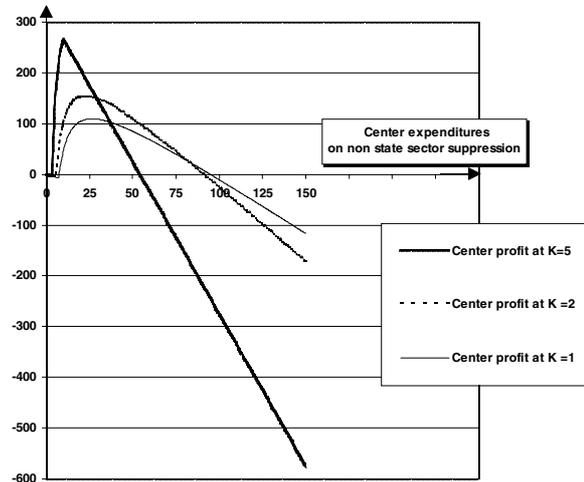


Figure 21. The Center Expected Profit and expenditures on non state sector suppression ($I_{min} = 175$, $I^0 = 200$, $L_{max} = 1$, $q = 300$)

О. Ястремський

ЛИСТ ПРО ЛИСТ

Ознайомившись із навчальним посібником О. О. Карагодової та Д. М. Черваньова “Мікроекономіка” (Київ, Четверта хвиля, — 1997), я був неприємно здивований, помітивши матеріал (див. сс. 43—58), що базується на моїх власних наукових результатах без посилань на мої роботи. Збіжності разуючі, аж до однакових позначень (див., наприклад, Yastremsky O. A Comparative Analysis of Labor Supply and Welfare Level in Different Social-Economic Environments, Ukrainian Economic Review, 1996, v. II (3), Philadelphia, pp. 53—72).

Нещодавно я отримав листа від одного з співавторів згаданого навчального посібника, який вважаю за потрібне навести:

“Пане професоре Ястремський!

На наш жаль, під час підготовки “Мікроекономіки” (Карагодова О. О., Черваньов Д. М.) ми не були знайомі з матеріалами Вашої книги (Основи мікроекономіки, О. Ястремський, О. Гриценко), а також з раніше опублікованою статтею. Це, безумовно, єдина причина відсутності посилання на Вас. Прийміть найщиріші вибачення, й прошу розглядати цей факт як прикру технічну похибку.

О. Карагодова

29.01.1999”