THE SHADOW ECONOMY IN UKRAINE

by

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ABSTRACT

This paper considers the problem of shadow economic activity in Ukraine. The shadow economy's integration into the analysis of the whole economy sheds a different light on meanings of various macroeconomic indicators (national income, market performance, households patterns etc.). This paper presents the results of estimating a share of the shadow economy in Ukraine in 1995-1998. A method of comparing official incomes and actual expenditures of households is used for the shadow economy quantifying. For the covered period the impact of the taxation policy on the development of shadow economy was not well defined. It is shown that if the shadow economy were converted to officialdom the budget deficit of Ukraine would be totally eliminated in 1995-1998.

ACKNOWLEDGEMENTS

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Section 1.

INTRODUCTION

Recent economic publications as well as researches made in Ukraine and abroad show that the problem of unofficial economic activity still generates interest. The importance of the problem for Ukraine can be explained in a variety of ways:

1. Ukraine has been experiencing transition for several years. "The transition to an open market-based economy entails changes in virtually all areas of the economy and significantly alters the activities of the key economic players" (Ouanes and Thakur, 1997, 11). Economic changes in a country like Ukraine are more perceptible than those of a country experiencing tranquil times, and hence, seem to be more attractive for the analysis.

2. Some economists confirm that integrating the unofficial economy into the analysis of the whole economy sheds a different light on the meanings of various macroeconomic indicators. For instance, "the interpretation of national income, of sectoral trends (such as trade, services and exports) and of labor markets and household patterns take an additional dimension, often leading to a different analysis than where the unofficial economy is ignored" (Kaufmann and Kaliberda, 1995, 2). Economists, policy makers, businessmen, managers and advisers make their analyses and decisions based on official statistical data. Analysis of unofficial activity should be taken into account by decision-makers and hence should correspond to higher efficiency of their decisions.

3. Growth in a relative share of unofficial activity reflects an inefficiency of domestic fiscal and monetary polices as well as with respect to law. This may also lead to an increasing

probability of corruption at all levels: from local to paramount officialdom. Moreover, "the associated growth of tax evasion leads to an increasing degree of cynicism about the role and power of government, and about the effectiveness of the tax system" (Giles and Caragata, 1998, 2). This in turn, may serve as a destructive force for a social stability and hence, for high social welfare. Therefore, policy implications based on an accurate analysis of unofficial activity are likely to have a positive effect on social welfare.

In summary, an analysis of the unofficial economic activity is important for Ukraine because it helps in studying specific features habitual to transition economies, it helps in doing effective macroeconomic accounting and policy decision making, and thereby affect social welfare.

Economic literature concerning unofficial activity uses a myriad of synonyms to determine a part of an economy where this activity is located. Those synonymous adjectives are as follows: black, bloody-black, cash, covert, dual, gray, hidden, illegal, informal, invisible, irregular, marginal, moonlight, parallel, second, shadow, subterranean, twilight, under-the-table, unobserved, unofficial, unrecorded, unreported. Throughout the paper I will use one term – shadow economy – the most habitual and widely used in Ukraine. Under shadow economy I will consider a segment of a national (total) economy where value added[1] is produced but not recorded in the official statistics. The concept of value added is used to measure gross domestic product of a country. Economists distinguish between market output and non-market output. The latter "includes mostly own-account production, such as a subsistence farming and owner occupied housing" (Ouanes and Thakur, 1997, 13) and is not a GDP aggregate by definition. Therefore, I will exclude from consideration such economic activities as natural

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[1] Value added is the value of gross output less the value of intermediate consumption.

farming, owner occupied housing, and work of housewives when mentioning the shadow economy. Additionally I will not take into account any illegal activity, although it generates value added. That includes corruption, property rights violation[2], and criminal activities like prostitution, production of weapons, drugs, etc.

This paper deals with evaluating the share of Ukrainian economy that operates in the shadow. A method of shadow evaluation uses statistics of households' official incomes and their real expenditures. A null hypothesis that an increase in tax burden drives economic activity of Ukraine into the shadow is tested. Results of the analysis are presented and discussed. The impact of the shadow economy on the budget deficit problem in Ukraine is shown.

The next section provides general characteristics of the Ukrainian shadow economy. Section 3 deals with the theoretical issues regarding the essence of the shadow economy phenomenon. A number of testable hypotheses are presented. Section 4 presents an overview of different methods for the shadow economy evaluation used in Ukraine. Methodology and the data used in the approach of comparing official incomes and total expenditures of households are explained in section 5. Results of calculations and discussions are also presented. The impact of the taxation policy on the shadow economy dynamics is discussed in section 6. Concluding remarks are reserved for section 7.

Section 2.

CHARACTERIZATION OF THE UKRAINIAN SHADOW ECONOMY

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[2] Under property rights violation I mean illegal use of copyrights, trademarks to generate income, e.g. "pirate" selling of software, video and audiotapes.

Several authors making their researches in the field of unofficial economic activity stress that "the history of the shadow economy originates with the beginnings of a State" (Vorobyov and Tymchenko, 1998, 7). "As a social phenomenon a shadow economy is an inherent feature of all countries despite what model as well as a level of social and economic development they face" (Mandybura, 1998, 7). The history of humankind proves that within a state form of social life organization a government always influences economic development by making laws providing budget, fiscal and monetary policies. Economists when analyzing the reasons for the shadow economy existence often come to the same conclusion: drawbacks of government budget, monetary and mostly tax regulation allow the shadow economy to exist. In particular, Kaufmann and Kaliberda (1995) distinguish the main bottlenecks for the Ukrainian entrepreneurs' ability to operate officially. Those are as follows: "i) the myriad of regulations in the foreign exchange and trade regime, ii) high inflation, iii) the high tax rates and volatile and often retroactive tax regulation" (Kaufmann and Kaliberda, 1995, 8). Their view seems to be the most interesting, since deals with the case of Ukraine, and hence, it requires precise consideration.

Firstly, impediments that enterprises face from government regulation imply high costs of operating officially. According to the analytical results presented by the State Committee for Business Undertakings annual average cost caused by the state regulation (registration, licensing, inspection of any kind, etc.) for Ukrainian enterprises in 1996 was as follows: for industrial companies – $21,780; for trade enterprises – $6,607; for market sellers – $746. Interestingly, that the former were inspected on average 35 times a year, the latter – 65 times, and the latest – for 296[3]. These figures imply that in order to mitigate official administrative

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[3] See *Galytsky Kontrakty*, #47, 1997, p.42.

impediments Ukrainian entrepreneurs are required to pay unofficial fees. Table 1 summarizes unofficial fee structure to resolve official administrative impediments – the results of a survey of 75 non-state and medium-sized enterprises in mid-1994 and of 150 state and private enterprises in 1996.

Table 1.
Unofficial Fee Structure to Solve Official Administrative Impediments

	Average fee		Share of businessmen considering paying unofficially as necessary	
	1994	1996	1994	1996
One Export License/Permit	$217	$123	96%	61%
Export Contract Paper work/processing	$189	-	-	-
Expedite Border Crossing	$194	$211	90%	100%
One Import License/Permit/Registration	$108	$278	93%	71%
Export Contract Paper work/processing per consignment	$101	-	-	-
Each Visit/Clearance from fire/health inspector	$40	$42	72%	81%
One phone line	$550	$894	95%	78%
Expedite creation of new enterprise	$186	$176	64%	66%
Each quarterly tax inspector visit	$91	$87	56%	51%
Unofficial office lease in state institution (monthly)	$305	$7/m^2	88%	66%
Access to preferential credit in domestic currency	$200	4%	-	81%
Access to preferential credit in US dollars	$250	4%	-	85%

Sources: Sydoruk, 1997, 43; Kaufmann and Kaliberda, 1995, 7.

Information presented in Table 1 shows that operating officially in Ukraine leads to increasing cost of doing business. Moreover, "such fees can in fact be interpreted as an extremely high implicit tax on the enterprise" (Kaufmann and Kaliberda, 1995, 7). Correspondingly, Wei considers the Ukrainian economy as one characterized by a high level of corruption on the one hand and by a high level of uncertainty on the other (bribe fees seem to be unstable in 1994 and 1996, see Table 1). "In country like Ukraine or Russia many bureaucratic agencies can impose independent bribe demands without being able to give any assurance of results" (Wei,

1997, 5). Finally, Wei concludes that corruption[4] is much more taxing than taxes in a large number of countries including Ukraine.

Secondly, the essential feature of the Ukrainian economy of the 1990's was inflation and hyperinflation. To finance its expenditures the Ukrainian government printed money, thus increasing money supply. According to NBU data money supply grew from UAH 0.3 mln. to UAH 7158 mln. in the period of 1991 – 1998[5]. As macroeconomic theory says, the increased money supply, in turn, may cause inflation. When prices rise, real value of money held by individuals and economic entities fall. That is, when government decides to print money it makes the money existing in the economy less valuable, thus hurting those (people and firms) holding it. Therefore, "inflation is a tax on holding money" (Mankiw, 1994, 153). In macroeconomic theory it is called an inflation tax. It is obvious that when facing inflation processes, economic agents are very much interested in payments being done on time. Therefore, there is a great incentive for the agents to make payments "personally" in cash without the help of the banking system. Such occasions tend to develop the shadow economic activity.

Finally, high and volatile tax rates faced by Ukrainian firms push them into the shadow. And it seems to be obvious, since "directors of Ukrainian companies as well as entrepreneurs often complain that one officially earned hryvna requires the same sum or even more to be paid in

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[4] In introduction I mentioned that would not consider corruption as a shadow activity and here use exact figures of bribe fees. There is no contradiction at this point. I refer to precise sums of corruption revenues only in order to prove an argument that corruption leads to higher costs for entrepreneurs to do business officially.

[5] See http://www.bank.gov.ua/r_4/MONEY%20INDICATORS/gm91-98.htm.

form of taxes" (Sydoruk, 1997, 43). Operating in such distorted conditions firms face a great incentive to hide in the shadows.

In summary, having analyzed the bottlenecks for enterprises to operate officially in Ukraine, one can easily conclude, that: i) they are the reasons the Ukrainian shadow economy exists, and ii) all of them may be considered as an explicit or implicit tax burden on enterprises operating officially.

Interestingly, the problem of high taxes and the shadow economy has been well known to the economists. For instance, Taussig in 1925 noted:

> "…not a little depends, to be sure on the amount of the tax. The higher it becomes, the greater is the danger of evasion" (Giles and Caragata, 1998, 3).

Guttmann in 1977 suggested that:

> "higher and higher taxes drive more and more of the economy underground, beyond the reach of tax collector" (Giles and Caragata, 1998, 7).

Slemrod in 1985 found that:

> "high marginal effective tax rates promote evasion, although there is no evidence that higher income earners engage in tax evasion more than lower income earners" (Giles and Caragata, 1998, 7).

Teryohin in 1998 argued that:

> "… taxation of transactions will merely push … transactions into the shadows, especially in a period of crisis" (Curty, 1998, 10, 3).

The conclusion that the tax burden seems to be the main reason for the shadow economy is crucial here since it helps for applying economic theory to understanding the shadow economy. I will present three theoretical issues referring to the microeconomic concepts of: i) optimal

consumer choice, ii) the Laffer effect, and macroeconomic concept shown in the model of Alm.

Section 3.

THEORETICAL ISSUES

3.1 The Concept of Optimal Choice

The concept of optimal choice can help in understanding the essence of the shadow economy. However, in this context, the concept should be reviewed to some extent. According to the microeconomic theory of consumer behavior, a rational consumer maximizes his or her satisfaction subject to a budget constraint. To accommodate the consumer theory to a problem of the shadow economy let's imagine that a rational consumer, in our case, is a firm producing output (goods or services). The objective of the firm is to maximize profit (i.e. utility) according to the budget constraint (taxation policy of the authorities that the firm faces). The firm is indifferent about combinations of two goods to consume – official income and income obtained from the shadow activity – to get the same amount of after-tax profit (i.e. utility). Indifference curve represents all combinations of those incomes that correspond to the same level of profit obtained. In turn, budget line represents all combinations of those incomes the firm is able to accept spending all factors available and taking into account the level of taxation.

Here a question about the shape of the indifference curve may arise. As it is known from the theory "the shape of indifference curves can imply different degrees of willingness to substitute one good for another" (Pindyck and Rubinfeld, 1998, 70).

First, imagine that official and shadow incomes, and hence official and shadow activities, are perfect complements (indifference curve is L-shaped). If they were actually perfect complements, changes in the slope of the budget line, or equivalently changes in the level of taxation, would not alter the firm's behavior, and the firm's optimal choice would be the same. However, empirical evidence shows that the size of tax rate, in fact, affects the level of shadow activity. In particular, Giles and Caragata in 1998 found that in New Zealand "a rising tax burden promotes greater hidden economic activity and more tax evasion" (Giles and Caragata, 1998, 15). Additionally, Giles argues that in the case of Canada "the extent of the tax burden is a major driving force for the hidden economy" (Giles, 1998, 13). Thus, as the position of the budget line determines the firm's involvement into the shadow, we may presume that official and shadow incomes should not be assessed as perfect complements for the firm.

Second, let's investigate the possibility that both official and shadow incomes are instead perfect substitutes (indifference curve is a straight line). If this were so the optimal solution would be a corner solution. That is, the firm will either i) produce officially or ii) hide its activity completely in the shadow. The former option seems to be unrealistic. Although some particular firm can produce officially all-out, this can not be said about all companies as a whole. We can hardly find an economy where all the output is produced officially, hence there exist firms operating in the shadow. Table 2 contains shares of the shadow economy in several countries and is presented to support this argument.

Table 2.
Size of the Shadow Economy as a Percentage of GNP in 1978.

| Country	Size of the shadow economy
Japan	4.1 %
United Kingdom	8.0 %
USA	8.3 %
Sweden	13.2 %
Canada	8.8 %

Source: Giles, 1998, 4.

The latter option – to hide economic activity completely to the shadow – seems to be impossible as well. To begin working, the firm should pay registration cost. Hence, its activity can not be completely invisible. Both options are likely to be unreasonable, and thus, corner solutions are unlikely to exist. Therefore, the assumption about perfect substitution between official and shadow incomes should be rejected.

Finally, the last possible characteristic of the indifference curve under discussion is well-behaved and reflecting convex monotonic preferences[6]. Such characteristic suggests that marginal rate of substitution differs along the curve. Here again a question may arise: what point is optimal on the indifference curve under discussion? In other words, what affects the firm's choice to substitute shadow activity for official processing? The easiest answer seems to be a tax burden that the firm has to bear when acting officially. Or equivalently, this is a ratio of costs of operating officially to those of operating in the shadow. However, operating in the shadow is not likely to be costless: a firm faces the risk to be detected by the officials. Giles and Caragata prove that "tax evasion is a learned process that is shaped simultaneously by the cost savings in the opportunities to evade and the constraints and related penalties against such illegal activity" (Giles and Caragata, 1998, 6). Moreover, "taxpayers appear to allocate their noncompliance to minimize expected penalties" (Klepper and Nagin, 1989, 23). Additionally, in the case of Ukraine, Kaufmann and Kaliberda find that "the decision and extent that an economic agent will choose to operate in the unofficial economy will be determined by the point at which the expected benefits of so doing equal (the risk-adjusted) expected costs" (Kaufmann and Kaliberda, 1995, 4). Interestingly, that they suggest an official tax burden to

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[6] See Varian, 1996, *Intermediate Microeconomics. A Modern Approach*, 4th ed., pp. 45-47.

play an important role in influencing a firm's decision to what extent it will produce in the shadow. Thus, according to the presented arguments we may conclude that the indifference curve under discussion tends to be convex and downward sloping.

The firm's optimal choice is shown in Figure 1. For simplicity assume that i) our firm follows rational behavior, ii) the only factor that determines the slope of a budget line is a tax rate, and iii) official and shadow incomes (or equivalently activities) are both normal goods.

Shadow income/activity

Figure 1. The firm's optimal decision about shadow activity.
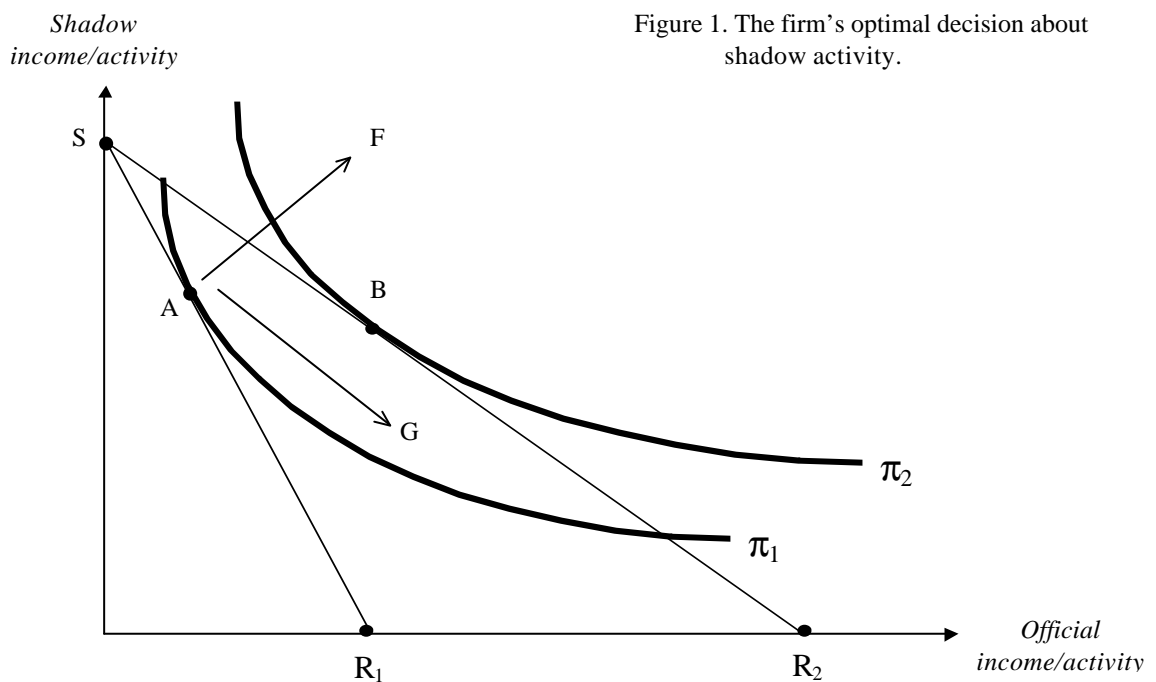
The firm's optimal decision is determined by point A where the expected benefits from the shadow activity equal expected costs (the budget line SR_1 is tangent to the indifference curve π_1). Arrow F represents an objective of the firm (micro target) – to get higher profits, i.e., to reach higher indifference curve. Arrow G, in turn, represents an objective of the government (macro target) – to increase a share of the official income in the economy since only the official income gives way to taxation. This theoretical draft also shows that if the government lowers the rate of taxation, both objectives – micro and macro – may be achieved. In particular, a

lower tax rate does not affect income when all the production process is located in the shadow. However, it increases income if the firm operates completely officially: the firm will be able to gain higher income due to lower cost. Lower tax rate will rotate the budget line round point S: from SR_1 to SR_2. New position of the budget line will change correspondence between expected benefits and costs from the shadow activity for the firm. As a result, the firm should change its attitude to the shadow behavior. The firm's new optimal decision is determined by point B where expected benefits from the shadow activity again equal the expected costs. As can be seen, both the firm and the government become better off after tax relaxation. On the one hand, the firm is able to gain higher profits (indifference curve π_2 is more preferable than π_1 for the firm). On the other hand, the share of the official income compared to the shadow income becomes larger[7] (MRS at point B is less than MRS at point A is). Similarly, increasing tax rates are expected to lead to lower profits for the firm and a higher share of the shadow activity in the whole economy.

In summary, the theoretical concept of the optimal choice suggests that the shadow activity can be influenced by the fiscal policy conducted by the government.

3.2 Laffer effect

The second theoretical point I am going to investigate is Laffer effect. The essence of the effect is that "when the tax rate is high enough, an increase in the tax rate will end up reducing the revenues collected" (Varian, 1996, 279). Arthur Laffer suggests that revenues collected by the

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[7] This also follows from the assumption about normality of both "goods". Substitution and income effects are both positive in this case, and total effect is, therefore, positive as well.

government, as a function of the tax rate must first increase and then decrease. Its graph, called Laffer Curve, makes comprehension easier (see Figure 2).
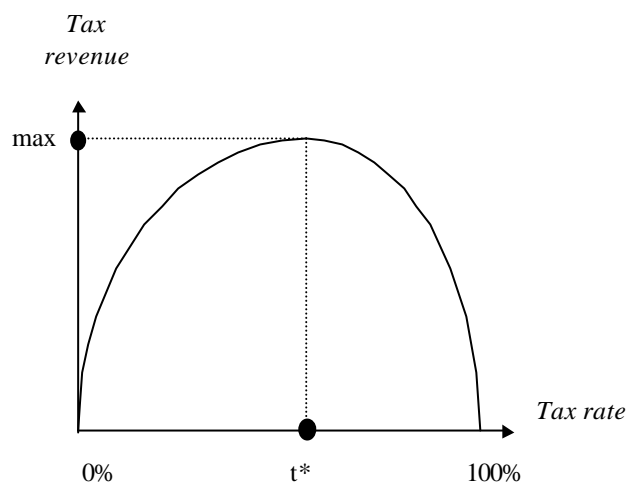

Figure 2. Laffer Curve

max- maximum tax revenue
t*- optimal tax rate

Laffer argued that decreasing marginal tax rate not only tended to make aggregate demand rise, but increased aggregate supply as well. Increasing of the latter might be due to rising incentives for economic agents to operate and also to enforced investments. This must be explained in details. A high marginal tax rate means that a larger and larger share of revenues goes to the tax collecting agency (i.e. government). The remaining disposable share of revenues, when marginal tax rate is high enough, may be considered as equal to that when a person or any economic agent works less with a lower marginal tax rate. That is, to have the same amount of disposable income economic agents may work more and pay high taxes or may work less and pay low taxes. Hence, when the tax rate exceeds a critical level, economic agents should face less incentive to work, and here we may presume that they prefer working in the shadow instead which is not controlled by tax collecting authorities. Thus, the relationship between the Laffer effect and the shadow economy seems to be straightforward: high tax rates push economic agents to operate in the shadow, and as a result, revenues collected by the government decrease. Interestingly, a similar argument was presented by A. Smith in early 1786. He argues that "high taxes sometimes by diminishing the consumption of the taxed commodities, and sometimes by encouraging smuggling, frequently afford a smaller
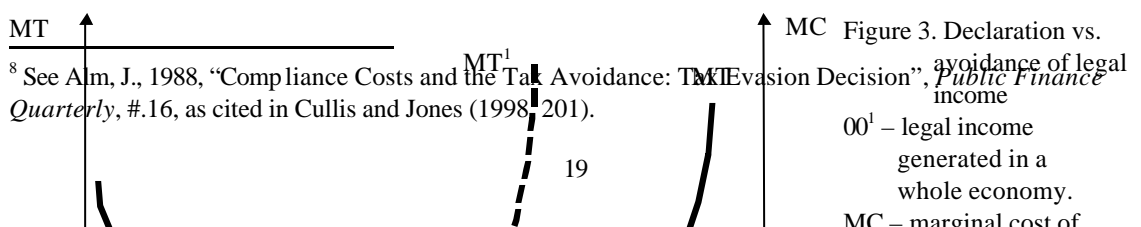
revenue to government that might be drawn from moderate taxes" (Smith, 1786, 354). Therefore, we may finally conclude that the shadow activity is closely connected with tax rates in the economy. And within the area of downward sloping Laffer curve higher tax rates promote shadow economic activity.

3.3 Macroeconomic view

Theoretical points presented in subsections 3.2 and 3.3 regard mainly microeconomics. They help to comprehend the way the economic agents make their decisions about how much to produce officially and in the shadow. However, the analysis of the shadow activity as a whole economic problem requires a theoretical background of the macroeconomic level. Here, a model of Alm (1988)[8] lends a helping hand. Assumptions of the model are as follows:

1. Consider income generated legally in the whole economy and it is constant.

2. The taxation system faced by economic entities implies progressive tax.

3. Marginal shadow cost of an additional $ of taxable income is an increasing function of taxable income.

While the first two assumptions seem to be understandable, the third one should be explained in detail. As shadow income increases relative to the official in the economy, state authorities begin paying more attention to the problem of the shadow economy. This results in increasing both amount of fines and probability of detection of unofficialdom. Therefore, an increase in shadow income costs more and more to economic entities in the economy. Figure 3 presents Alm's model.

MT

MT^1

MC

Figure 3. Declaration vs. avoidance of legal income

[8] See Alm, J., 1988, "Compliance Costs and the Tax Avoidance: Tax Evasion Decision", *Public Finance Quarterly*, #.16, as cited in Cullis and Jones (1998, 201).

00^1 – legal income generated in a whole economy.

MC – marginal cost of

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MC

The optimal allocation point indicating the shares of reported and shadow income in the economy is determined by intersection of MC and MT curves. Tightening fiscal policy moves marginal tax curve upward making it steeper ($MT \rightarrow MT^1$). A new intersection of the two curves determines new shares of the reported and the shadow income in favor of the latter in the whole economy ($q \rightarrow q^1$). Hence, the model of Alm predicts that an increase in tax rates drives economic activity to the shadow further from officialdom.

In conclusion, investigation of the three theoretical concepts shows that economic theory actually helps in analyzing the phenomenon called shadow economy. The concept of optimal choice argues that a firm will determine its behavior in question using cost-benefit analysis, i.e. it will choose between official and shadow activity at a point where expected benefits from tax evasion equal expected costs. The following testable hypothesis is based on the concept of optimal choice: a lower tax burden makes firms able to get higher profits and simultaneously to

reallocate their activity in favor of officialdom. The Laffer effect seems to be helpful in understanding the relationship between economic theory and shadow economy as well. A possible testable hypothesis is straightforward here: in the area of the downward sloping Laffer curve lower tax rates reduce the shadow economy. The same testable hypothesis follows from Alm's macroeconomic model: tightening fiscal policy promotes the shadow economy.

Section 4.

METHODS OF THE SHADOW ECONOMY ESTIMATION

4.1 Classification of the methods

To estimate the shadow share of an economy, analysts should use a particular method or combinations of methods. In this section I present a review of estimates of the shadow economic activity related to different methods whenever used in Ukraine and other countries.

Turchinov (1996) suggests that methods frequently used in the literature for the shadow economy evaluation can be divided into five groups:

1. Sociological methods.

2. Statistical methods:

− analysis of discrepancies in official statistics.

3. Monetary method.

4. Structural (industrial) methods.

5. Special methods.

Several methods among these mentioned above were applied to the Ukrainian reality since independence.

4.2 Sociological methods

Sociological methods are based on the results of interviews of households, of experts' investigation of economic activity as well as of tax authorities' inspections. These results allow

to evaluate the counterparts of the shadow economic activity. The main requirement for those methods is that the population sample contacted is to be representative. One of the methods in kind – extractive inspection – was successfully used in Austria (Nikolayeva, 1987). In Ukraine the sociological methods were used by Kaufmann and Kaliberda – analysts from the World Bank – in 1994. They interviewed directors of 75 small and medium sized enterprises and found that from 10% to 25% of the revenues obtained were spent on solving official administrative impediments. To avoid such bureaucratic pressure the directors preferred hiding in the shadow. The experts inferences made in virtue of the above figures show that in 1993-1994 the share of the shadow value added generated by the private enterprises was 45%-60%. For the state owned enterprises that share was estimated at the level of approximately 50%. As for employees interviewed in 1994 70% of them had additional unofficial jobs. Income obtained from unofficial jobs was estimated at the level of 50% of the total income of those contacted (Turchinov, 1996,140).

The research done by the World Bank (Kaufmann and Kaliberda, 1994) is undoubtedly useful for Ukraine. However, its results were obtained using a data sample that was not representative. Turchinov (1996) argues that due to this fact they were biased and hence did not represent the actual shadow.

4.3 Analysis of discrepancies in official statistics

The method assumes that the shadow economy can be estimated as a difference between total expenditures on goods and services in an economy and incomes obtained officially (savings are considered as a part of expenditures). When using this method, analysts count a difference between GDP calculated with the income approach and total expenditures on goods and

services for the same period. In the economy without shadow production the difference should

be zero. In the economy where shadow activity takes place the difference is expected to be

negative, since incomes obtained unofficially are spent on goods and services. Data on official

incomes are provided by State Statistics Authorities and/or Tax Administration. Data on total

expenditures are usually received from interviewing selected enterprises and households and

"seem to be reliable since contacted individuals usually do not shelter true information except

about expenditures on alcohol, drugs or illegal services" (Turchinov, 1996, 141). However,

Turchinov argues that this method is unable to provide precise estimates of the shadow in a

country facing dramatic changes in households' savings.

Economic literature shows wide discrepancies in official statistics in England (Makofee,

1980). In Ukraine this method was implemented in 1996 when estimating the shadow

economy for the two previous years. Official incomes (including wages, transfers and

pensions) were compared to expenditures on individual consumption determined by experts.

A difference calculated is presented in Table 3 below.

Table3.
Estimated Difference between Total Economic Incomes and Expenditures in Ukraine

Period	Income[*] (bln. Krb.)	Expenditures[**] (bln. Krb.)	Difference	
			Total (bln. Krb.)	as a % of GDP
1994	539	602	63	5.2%
1995	2370	3022	653	12.3%

[*]Official data
[**]Experts' estimates

Turchinov suggests that results obtained from the analysis of discrepancies in the official

statistics can be accepted as the lowest possible level of the shadow economy in Ukraine.

4.4 Monetary method

This method was elaborated by Cagan (Cagan,1958) and was called later as "monetary approach". The essence of the approach lies in following. It is logical to suppose that shadow money flows circulate out of the banking system. Hence, "having estimated a share of national currency in cash used for the shadow activity, it becomes possible to determine incomes obtained there" (Tissen, 1997, 70). However, this method does not take into account two points: a part of shadow value added generation financed with foreign currency as well as that using barter, which are both natural for economies in transition. Having taken into consideration the drawbacks of the monetary approach, Tissen found that in Ukraine in 1995 the shares of the shadow economy in official GDP and total GDP (sum of value added produced in officialdom and in the shadow) were 47% and 32% respectively.

4.5 "Electric Power Consumption" method

Some special methods of the shadow economy estimation assume that changes in official GDP are accompanied by some variable closely related to the dynamics of total GDP. For Ukraine, as for other economies experiencing transition, electric power consumption was chosen as an indicator of the total economic activity. Kaufmann and Kaliberda in 1995 and a group of Ukrainian experts (Borodyuk, Turchinov, and Pryhodko) in subsequent years estimated the shadow economy in Ukraine for the period of 1990-1994 on the basis of the "Electric Power Consumption" method. In particular, Kaufmann and Kaliberda found that the shadow ranged from 16.2% to 48.5% of the total GDP assuming unitary elasticity of electricity consumption response to output changes. Table 4 presents their estimates.

Table 4.
Ukrainian Shadow Economy Estimated with "Electricity Consumption" Method

	Shadow economy share

Period	as a % of official GDP	as a % of total GDP[*]
1990	18%	16.2%
1991	33%	25.8%
1992	52%	34.7%
1993	64%	39.7%
1994	92%	48.5%

[*]Under total GDP the analysts distinguish the sum of value added produced in officialdom and in the shadow.

Source: Kaufmann and Kaliberda, 1995, 15; Tissen, 1997, 73.

To summarize, different methods applied to Ukraine lead to different results. Sociological methods' estimates can not be accepted as a whole country indicator due to data used were not representative and as a result they may be interpreted as biased ones. When using statistical methods it is usually expensive and difficult to obtain true information about real expenditures through interviewing economic agents. Despite these drawbacks such estimates can be considered as the lowest level of the shadow economic activity. The monetary method does not take into account shadow's financing in foreign currency and barter which are both habitual for transition economies. Even when paying attention to those features, estimates of foreign currency shadow flows are founded on certain assumption, and thus can not be reliable. The special method based on electricity consumption gives the largest shadow economy share estimated. However, it implies an assumption as well, about elasticity of electricity consumption with respect to output changes. Moreover, the method can not accurately measure the shadow output of sectors that consume relatively less electricity. Due to the assumption and different shares of electricity input in economic sectors the "Electricity hardly be accepted as a totally reliable method.

In conclusion, "up to now neither in economic literature nor in practice concrete and sufficiently reliable methods of the shadow economy estimation were elaborated yet"

(Mandybura, 1998, 54). Table 5 summarizes estimates of the Ukrainian shadow economy obtained by different methods for a period of 1990-1995.

Table 5.
The Shadow Economy of Ukraine Estimated by Different Methods
as a % of Official GDP

Period	Method			
	Sociological	Official Statistics Discrepancies	Monetary	"Electric Power Consumption"
1990				18%
1991				33%
1992				52%
1993	45%[*] and 50%[**]			64%
1994	60%[*] and 50%[**]	5.2%		92%
1995		12.3%	47%	

[*] Shadow value added generated by private enterprises
[**] Shadow value added generated by state owned enterprises

To test a hypothesis about taxation policy impact on the shadow economy dynamics the shadow dynamics data are needed. Unfortunately, former researches in question done in Ukraine do not provide with sufficient number of observations. Besides, the estimates were obtained with a help of different methods discussed above, and hence, can not be included into one set of observations. Therefore, the next section is devoted to quantifying the shadow share of the Ukrainian economy quarterly for the period of 1995(Q2) – 1998(Q2).

Section 5.

QUANTIFYING THE SHADOW ECONOMY SHARE

5.1 Explanation of methodology and data

The previous section was devoted to different methods used for the shadow economy estimation. To calculate the shadow economy in Ukraine I use a combination of sociological and statistical methods. In particular, a negative difference between households' official incomes and total spending on goods and services is expected to indicate the shadow. In the President's Report "On Social and Economic Development in 1996" (p.4) it was emphasized that "the official statistics data do not always reflect the real situation. According to the poll of 2,300 households an average consumption of households exceeds that of their would be average income 1.8 times and even 23 times for certain strata of population. And this, in turn, confirms the existence of a substantial turnover of undeclared and thus non-taxed activity". Therefore, a comparison of nominal incomes of Ukrainian households to their actual expenditures seems to be useful in quantifying the shadow economy in Ukraine.

The data used in my approach are the results of interviews of selected households as well as of experts' investigations. Information about official incomes was obtained from official statistics (State Statistics Committee of Ukraine), and that about total expenditures was received from analytical results of experts from HIID-CASE Macroeconomic Reform Project[9].

Both pieces of data employ quarterly figures for the period from 1995 (Q2) to 1998 (Q2). The nature of them should be explained in detail here. Data on the official incomes are
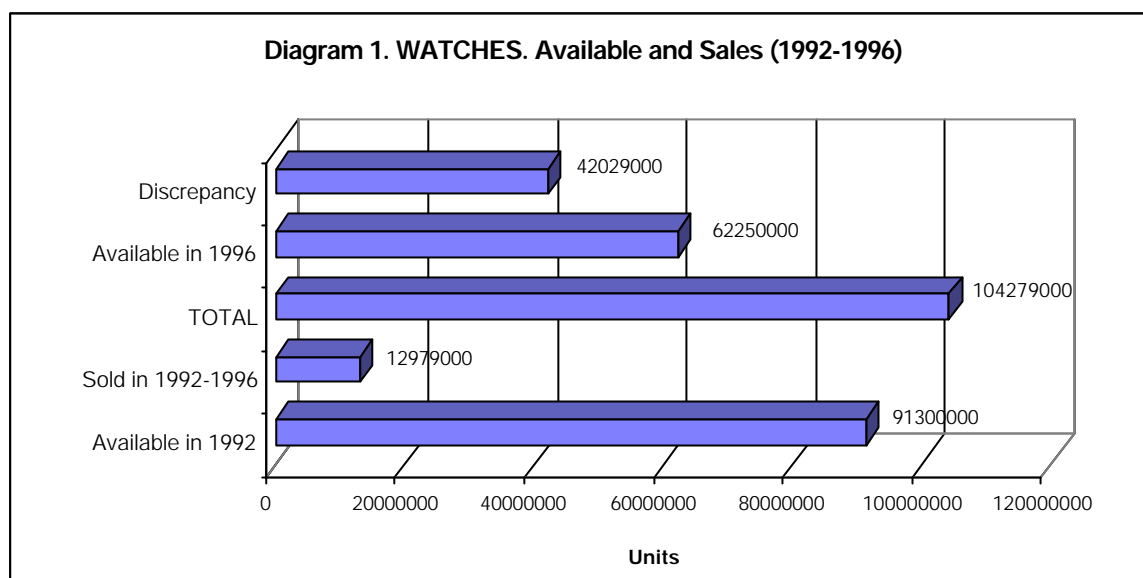
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[9] I'm deeply thankful to Natalia V. Svetlacova (SSCU), Alina Kudina (CASE) and Alexander Babanin (HIID) for indispensable assistance in providing data.

gathered through interviewing randomly chosen households. Their number ranged from 14,359 to 16,370 quarterly. Questionnaires included items on: wage and salary paid, pension, stipend, payment on social insurance received, State allowance to mothers of large families and that to unmarried mothers, allowance to unemployed, income from subsistence farming, income from private property and capital, insurance income, alimony, borrowing, financial aid from relatives and acquaintance, money taken from bank deposits. Official statistics presents data as average on 100 family members. Using average annual population of Ukraine official incomes of households were aggregated.

In today's Ukrainian economy the signs of differentiation of a society are noticeable. The newcomers can be astonished by a substantial number of western-made vehicles, grand openings of new businesses, agencies providing travel services, restaurants and cafes, increasing number of mobile phone users, Internet providers, etc. And that takes place within an officially declining economy. Such a contradiction makes it possible to surmise that people in Ukraine permanently spend more than they officially earn. Figures on actual households' expenditures are the results of research done by experts from HIID-CASE Macroeconomic Reform Project. They were obtained in a way of assessing sales of four categories of commodities: durables, nondurables, services and foodstuff. The experts (particularly Alexander Babanin) call their method a "Visible Consumption Approach". In the approach they use data from such official statistical publications as "Ukraine in figures" and "Statistical

-1998. Both sources are official editions of State Statistics Committee of Ukraine. Additionally, the results of budget surveys conducted by a number of sociological centers as well as information from business experts published in "Galytsky Kontracty", "Business" and other Ukrainian business periodicals were used.

The essence of the approach lies in looking for statistical discrepancy. In particular, for assessing actual sales of *durables* the following procedure was applied. A number of units of a certain durable commodity, say commodity i, in Ukrainian households in 1992 was taken as a benchmark. Ukrainian business publications present figure of that commodity i sales during a particular period, say from 1992 to 1996, indicating the experts' view. The sum of quantity available in 1992 and quantity sold in 1992-1996 should indicate quantity of the commodity i available in Ukrainian households in 1996. However, the obtained sum exceeds the official data on the commodity i possessed by the Ukrainian households in 1996. The example of watches makes understanding easier. According to A.Babanin's calculations there were 91,300,000 watches available in Ukrainian households in 1992. Information from unofficial sources presents that in 1992-1996 12,979,000 units of watches were bought by households. Hence, by 1996 the households were expected to possess 104,279,000 (=91,300,000+12,979,0000) units of watches. However, official sources of statistical data present a figure of 62,250,000 units of watches available in 1996, a discrepancy of 42,029,000 units. It was accepted that only a half of this discrepancy should be considered while calculating actual value of expenditures of the households since i) unofficial information of business experts might not be true and ii) during 1992-1996 a certain share of watches were out of use due to attrition and could not be used any more. Diagram 1 presents the above calculations.

Diagram 1. WATCHES. Available and Sales (1992-1996)

Category	Value
Discrepancy	42029000
Available in 1996	62250000
TOTAL	104279000
Sold in 1992-1996	12979000
Available in 1992	91300000

Source: A.Babanin, HIID.

Such kind of calculations were made for many durables: watches, radios, TV-sets, refrigerators, washers, bicycles, vacuum cleaners, cameras and cars.

For *nondurable goods* the experts in assessing real sales applied another procedure. It was assumed that in 1990 official sales of nondurables coincided with the actual sales. According to the official statistics Ukrainian households' demand for nondurables was declining in subsequent years. For example, in 1995 and 1996 sales of laundry soap were less than 20% of the 1990 level. According to A.Babanin's view such figures are unlikely to indicate the truth. He assumes that only 50% of such substantial decline can be explained by changed market conditions, i.e., population of Ukraine diminished, purchasing power of households' incomes decreased, market demand on substitutes might increase. Another 50% should be taken into account when estimating actual expenditures on laundry soap as a nondurable commodity. The example of laundry soap is presented by Diagram 2.

Diagram 2. Sales of Laundry Soap (1990-1996, thousands of tons)
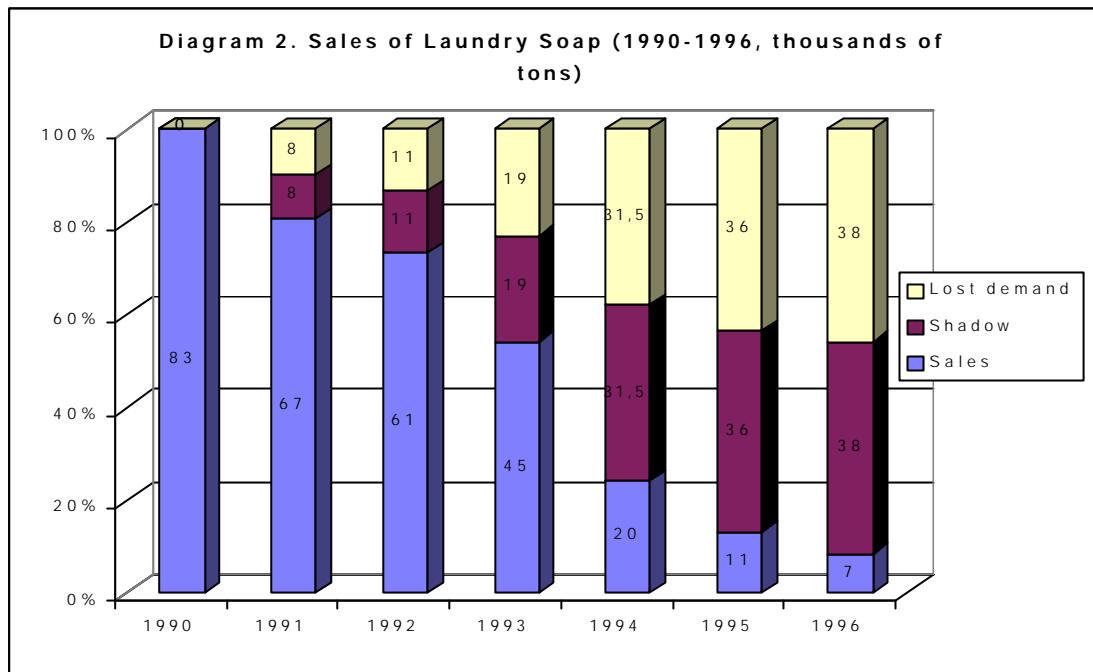
Source: A.Babanin, HIID.

Actual sales of *services* were estimated using similar procedure as that for nondurables.

When evaluating total expenditures on *foodstuff* the experts accepted that during 1995-1998 per capita consumption of food was at the level of $2 daily in Ukraine. A.Babanin got this piece of information from the experts of "Business" magazine. Extrapolating this figure to the population size and subtracting figures of subsistence farming that are contained in official statistics, estimates of real spending on food by Ukrainian households were obtained.

The sum of the results received for durable and nondurable commodities, services and foodstuff indicate total expenditures of Ukrainian households.

5.2 Results and discussions.

After the data became available a difference between real spending and official income of Ukrainian households was calculated in monetary terms as well as a percentage of official GDP (See Table 6).

Table 6.
Estimated Difference between Economic Incomes and Expenditures of Households
in Ukraine

Period	Income[*] (bln. Hrn.)	Expenditures[**] (bln. Hrn.)	Difference	
			Total (bln. Hrn.)	as a % of official GDP
1995 Q2	5.305	10.638	5.333	53.31
Q3	7.289	16.930	9.641	62.93
Q4	8.516	14.300	5.784	27.03
1996 Q1	9.049	14.879	5.829	34.05
Q2	9.900	15.132	5.231	27.83
Q3	10.912	24.221	13.309	63.98
Q4	10.789	18.011	7.222	29.12
1997 Q1	10.793	18.135	7.342	38.46
Q2	11.120	18.309	7.189	33.98
Q3	12.617	27.379	14.762	58.15
Q4	12.367	20.745	8.378	30.21
1998 Q1	11.617	19.995	8.378	40.27
Q2	11.728	20.554	8.826	36.90

Sources: Official statistics, HIID, and author's calculations. [*]Official data
[**]Experts' estimates

Diagram 3. The shadow economy in Ukraine as % of official GDP

The last column of Table 5 is reproduced graphically (see Diagram 3).

Source: author's calculations

As can be seen from the diagram the form of the graph is W-shaped. Interestingly, during the analyzed period, the shadow economic activity reached its minimum level in the 4th quarter of 1995 (32.03%) and maximum level in the 3rd quarter of 1996 (63.98%). Additionally, the diagram shows that shadow index of the 2nd quarter does not differ much from that of the 4th quarter in 1996 and 1997 (27.83% vs. 29.12% and 33.98% vs. 30.21% respectively). However, such a relationship can not be treated as final. For 1995 these figures differ considerably: the level of the 2nd quarter is almost twice as much as that of the 4th one (53.31% vs. 27.03%). The level of the 1st quarter is slightly higher than those of the 2nd quarter of the same year and of the 4th quarter of the previous year. The shadow economy takes its highest annual level in the 3rd quarter, which is proved by the three spikes of the graph (62.93%, 63.98% and 58.15% in 1995, 1996 and 1997 respectively). Possible explanation of the 3rd quarter shadow expansion may be traditional summer vocation period. Summer service sector may generate additional shadow. Since demand for tourist services, recreation services as well as for ice cream, cola, beer, etc. increases drastically in summer, it is easy to hide economic activity when the number of providers increases (probability of detection by tax administration falls). Moreover, many firms providing "summer" services exist only for the summer period and then go out of business till the next vocation season.

In fact, a share of the shadow economic activity in nominal GDP seems to be periodical. Each 1st quarter of the covered period it increases slightly compared to the 4th quarter of the previous year. Then it declines in the 2nd quarter. The 3rd quarter faces a rapid rise, followed by the precipitous drop in the 4th quarter. Such kind of the shadow economic behavior seems to recur every year of the covered period.

Section 6.

**THE TAXATION POLICY IMPACT**

6.1 Econometric attempt

To test the hypothesis that lower tax rates reduce the shadow economy, the Tax revenue/official GDP ratio was taken as a proxy variable for the tax burden. The proportional rate of growth in real GDP was included as a second explanatory variable, in view of cyclical nature of the shadow economy share. However, OLS regressions of different specifications did not prove the hypothesis: all obtained coefficients were insignificant (low t-statistics and high p-values) and coefficients of determination were low. Such econometric outcome could not be treated as a final one since i) there might be problems with data reliability (as it was already mentioned, any estimates of the shadow economy could not be accepted as completely true), ii) there were insufficient observations and iii) a functional form of the shadow economy response to the [Tax revenue/GDP] ratio dynamics was not theoretically specified. As a result, I concentrated on the graphical analysis to examine the relationship between the shadow economic activity and the taxation policy.

6.2 Graphical analysis

Diagram 3 was supplemented with a graph indicating changes in the [Tax revenue/GDP] ratio for the same period. Data for the [Tax revenue/GDP] ratio were taken from Ukrainian-

European Policy and Legal Advice Center (UEPLAC)[10]. The result is Diagram 4, which

Diagram 4. Relationship between shadow economy and fiscal policy in Ukraine
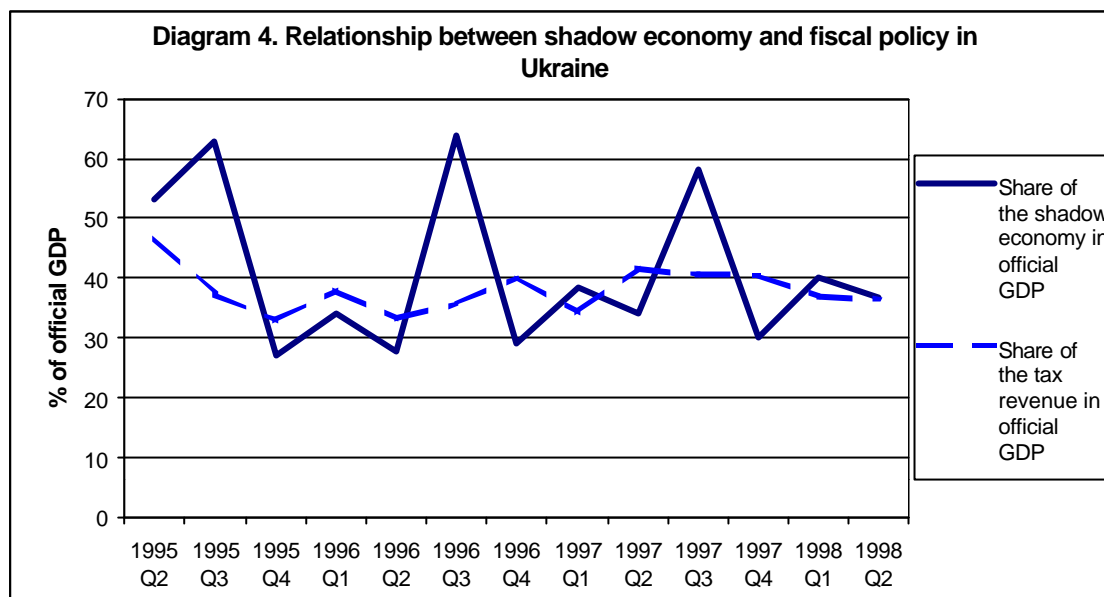
allows one to compare both trends.

Sources: UEPLAC, author's calculations.

Diagram 4 shows that in the period from 1995 Q3 to 1996 Q3 both trends coincide: shadow

economy faces growth as [Tax revenue/GDP] ratio grows and when [Tax revenue/GDP] ratio

falls the shadow economic activity declines. It can be suggested that during this period the

shadow economy dynamics does not contradict with theory. However, in all other quarters

remained the trends were the opposite: when tax burden rose the shadow economic activity

damped, and vice versa. Such relationship might be explained by time lags, i.e., the shadow

economy increased in response to increased [Tax revenue/GDP] ratio of the previous quarter

or quarters. Additionally, upward sloping of the shadow economy graph when the tax burden

declined might be interpreted by higher weights of implicit taxes (i.e. corruption and bribes)

compared to the official tax liabilities faced by Ukrainian enterprises. Anyway, neither

econometric nor graphical analyses of quarterly data proved the consistency of economic

theory regarding the shadow economy response to the taxation policy in Ukraine in 1995-

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[10] See http:\\www.ueplac.kiev.ua.

1998. Interestingly, when considering annual data, which are possible to aggregate for 1996 and 1997 only, the theory seems to be consistent. In 1996 the shadow share in official output was at the level of 38.6% and Tax/GDP ratio – of 38.6%. For 1997 these indexes were 40.3% and 42.4% respectively. It is easy to see that when Tax/GDP ratio rises the shadow economic activity increases. However, two annual observations are definitely not enough to conclude that Ukrainian shadow economy grows in response to increased tax burden.

6.3 Tax-Gap as a result of the shadow economic activity

Despite the impact of the taxation policy on the size of shadow economy was not well defined, the size of the tax-gap (i.e. the proportion of potential tax revenue that is forgone as a result of the shadow activity) can be computed. It was done as:

$$Tax\text{-}Gap_t = TR_t * \{SH/GDP\}_t, \text{ where}$$

TR – tax revenue collected, SH/GDP – share of the shadow economy in the nominal GDP, index "t" represents period. The results of the calculation are shown in Table 7.

Table 7.
Tax-Gap as a Result of the Shadow Economy in Ukraine

Period	Tax revenue consolidated (mln. Hrn)	Tax-gap		Budget ballance (mln. Hrn)
		in mln.Hrn	in mln. USD	
1	3	3	4	5
1995 Q2	4658.9	2483.7	1460.9	-586.2
Q3	5723.9	3602.1	2029.4	-1015.2
Q4	7046.8	1904.8	1054.7	-1773.1
1996 Q1	6504.6	2214.8	1155.9	-1141.2
Q2	6241.8	1737.1	969.9	-779.4
Q3	7436.6	4757.9	2769.4	-587.4
Q4	9958.9	2900.1	1573.6	-1108.9
1997 Q1	6540.7	2515.6	1389.1	-1046.8
Q2	8796.6	2989.1	1634.3	-1176.9
Q3	10319.9	6001.1	3235.1	-2474.9
Q4	11232.5	3393.3	1800.2	-1497.7
1998 Q1	7677.5	3091.7	1534.3	-1367.1
Q2	8723.1	3218.8	1585.6	-797.7

Sources: UEPLAC, author's calculations.

As can be seen from the above table the tax-gap ranged from 1737.1 Million Hrn. to 6001.1 Million Hrn. in nominal terms, or equivalently, from $969.9 Million to $3235.1 Million each quarter of the covered period.

The last column of Table 6 contains figures of the budget balance in 1996-1998. Negative signs indicate that during the period Ukrainian government budget faced deficit. When comparing figures in the 3rd and the last column it is easy to see that those of the 3rd column exceed those of the last one in absolute values. At this point it is hard to escape the conclusion that if the shadow economy were eliminated the tax revenue would be completely enough to cover budget deficit.

Section 7.

CONCLUDING COMMENTS

In this paper I have used a comparison of official incomes and real expenditures on goods and services by households to estimate the size of the shadow economy in Ukraine. The shadow economic activity was estimated both in nominal terms and as a percentage of official GDP quarterly from 1995(Q2) to 1998(Q2). As a share of nominal GDP it ranged from 27.03% to 63.98% and seemed to be periodical. Its level in the 3rd quarter exceeded dramatically those of three other quarters each year.

In evaluating the taxation policy impact on the shadow economy, econometric analysis was not useful. This may be due to problems with data. The data used might not account for fundamental systemic transformation that Ukraine has been undergoing as a transition economy. Additionally, different inflation rates in 1995-1998 might create distortion in data. When applying graphical analysis, the tax impact also was not well defined. This can be explained by inadequacy and insufficiency of information, changeable time lags and fickle weights of explicit (official) and implicit (unofficial) tax burden faced by the Ukrainian enterprises.

I have also computed the proportion of potential tax revenue as a result of the shadow economic activity in Ukraine. The Tax-Gap ranged from 1737.1 Million Hrn. to 6001.1 Million Hrn. in nominal terms, or equivalently, from $969.9 Million to $3235.1 Million each

quarter in the mentioned period. It is also shown that the budget deficit would be completely eliminated if the shadow economy were converted to the officialdom.

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