



Trends in  
**Applied Sciences  
Research**

ISSN 1819-3579



Academic  
Journals Inc.

[www.academicjournals.com](http://www.academicjournals.com)

## **Case Study of the Size, Causes and Consequences of Shadow Economy (On the Example of the Republic of Armenia)**

Arman A. Grigoryan

Department of Management and Entrepreneurship, French University in Armenia,

---

**Abstract:** This study discusses various factors that have contributed to the development of the shadow economy in Armenia. The main causes for the existence of the shadow economy are argued to be the tight and unfair tax administration and regulations and the corruption. Many of the shadow activities in Armenia relate to the problem of non-reporting and/or under reporting by business entities. There is a significant amount of economic activities that are not captured by the official statistics.

**Key words:** Shadow economy, business entities, GDP, Guttman's method

---

### **INTRODUCTION**

First of all it is worth to mention that because of its multifaceted nature there is still no overall agreement on the terms and definitions used to describe the problem of shadow economy. Various definitions and terms have been used in the international and local literature to describe the phenomenon that is widely known as shadow or underground economy.

Today, the problems of shadow economy and the measurement of its size and scope are a major challenge for Armenia's further development. Because of the peculiarities of the transitional period, the social, political and economic difficulties and many external factors the researchers and policymakers in Armenia have had difficulties in estimating the actual magnitude of the shadow activities in Armenia. The government itself realizes the need to fight the shadow economy and devoted a section about the problem in its Poverty Reduction Strategy Paper (2003). The PRSP highlights the problem of shadow economy and mentions tighter control over incomes resulting from illegal economic activities and limiting of cash transactions as the main directions for the government's strategy aimed at reducing the hidden economic activities (Anonymous, 2003). The MTEF program for 2005-2007 approved by the government also highlights the need to fight against hidden economic activities to raise the tax revenues to GDP ratio by 0.4% annually (Anonymous, 2004b).

Despite the importance of the problem so far there has been very limited research discussing this phenomenon in Armenia. The National Statistical Service makes some estimates of the size of the shadow economy, which, however, are not done in a comprehensive and periodic manner. The most recent figure about the official estimate of the size of the underground economy of Armenia was published in 1999, according to which the size of the unrecorded sector of the Armenian economy in 1999 was at a level of 28.9% of the official GDP (National Statistical Service of Armenia, 1999).

### **METHODS OF ESTIMATING THE SIZE OF THE SHADOW ECONOMY**

It is important to realize that because of the nature of the problem, it is almost impossible to measure the exact size of the economic activities taking place in the shadow economy in any country of the world, whether developed or less developed. Over the past decades different authors and

research institutions have tried to develop effective methods for estimating the size of the shadow economy in many countries, but there is no clear preference for any particular method or approach. However, the review of the professional literature suggests that the methods used to estimate the magnitude of the underground economy can be categorized into two main groups: direct and indirect (Aigner *et al.*, 1988).

The direct approaches use volunteer surveys and samples to get information about the hidden economy directly from its participants. A sample of individuals and businessmen is chosen and respondents are asked whether they have participated in any underground activity or not. If the sample is representative enough and the participants are sincere in their answers then it is possible to estimate the extent of the shadow economy. As one can fairly argue the results of such surveys may not capture all the hidden activities in the economy because the estimation depends on the honesty of the questioned individuals. It is unlikely that any illegal economic activity that may also involve some criminal elements be reported to surveyors. This is especially true for the transition countries like Armenia where there is still a strong fear about the real confidentiality of any survey and the survey participants are afraid to reveal the truth about their economic activities. The direct methods are not able to provide any information about the developments or trends of the underground economy over time. They only provide point estimates of the size of the shadow economy. Another disadvantage of the micro approach (Feige, 1990) is that surveys are relatively expensive to conduct and comparable surveys across different countries are unavailable.

In contrast to the direct methods, the indirect methods use different macroeconomic indicators to estimate the size of the shadow economy. Therefore, this approach is sometime referred in the literature as macroeconomic approach. Many economic indicators are affected by the development of the hidden economy. Because they are based on existing macroeconomic data, many countries have used these methods to assess the size of the hidden economy.

The first method that has been used to measure the size of the underground economy is the discrepancy between total national expenditure and income. Because there are two ways to compute national income-through the measurement of aggregate expenditures or income-many countries find that national income calculated from reported total expenditure exceeds the national income calculated from reported income. The initial discrepancy between expenditure and income can be the estimate of the size of the underground economy (Park, 1979). A much discussed disadvantage of this method is that the discrepancy in national accounts may be due to measurement errors in national account statistics rather than the size of the underground economy.

The second macroeconomic indicator used in estimation of the size of the shadow economy is the discrepancy between the official and actual labor forces of the country. The key assumption of this method is that any decrease in labor force activity in the regular economy is considered an increase in labor force participation in the underground economy. The difference between the official and actual labor forces participation (including the hidden economy) gives the estimate of the labor force employed in the underground economy. The main shortcoming of this method is that fluctuations in the size of the labor force can be the result of changing economic incentives, rather than the growth of the underground economy.

The third approach is based on Irving Fisher's quantity theory of money, which can be presented by this equation:  $M \cdot V = P \cdot T$ , where, M-money supply (currency in circulation + demand deposits); V-velocity of money; P-prices; T-total transactions. The basis for this approach introduced by Feige (1990) is an assumption that any economic activity, whether official or underground, uses cash money for transactions. If the money supply and the velocity of money are known, then the value of total transactions (PT) can be calculated. Assuming the value of the total transactions is equal to the total nominal GNP, then the difference between total nominal GNP and officially measured GNP is the estimate of the value produced in the underground economy. Feige (1990) assumed that the velocity

Table 1: Shadow economy's size using electricity consumption method, as a percentage of official GDP, 1990-1997

Country	1990	1991	1992	1993	1994	1995	1996	1997
Armenia	31	50	143	108	80	74	93	65
Azerbaijan	28	22	16	52	79	103	101	99
Belarus	18	21	20	18	23	28	20	15
Bulgaria	34	34	34	34	32	44	70	-
Croatia	30	39	28	36	34	31	27	44
Czech Republic	7	18	18	23	24	24	25	23
Estonia	25	34	33	45	66	75	78	71
Georgia	33	45	112	153	116	126	105	87
Hungary	37	43	36	38	34	38	41	37
Kazakhstan	20	35	32	41	30	46	33	27
Kyrgyz Rep.	20	30	53	91	142	261	199	180
Latvia	15	21	49	40	35	38	39	-
Lithuania	13	19	23	36	43	38	11	-
Macedonia	30	44	48	75	89	108	128	135
Moldova	22	45	88	41	130	127	140	-
Poland	24	30	23	21	17	15	13	-
Romania	29	21	24	19	11	12	15	24
Russia	17	18	30	35	45	53	54	52
Slovakia	6	15	14	19	16	11	18	-
Slovenia	30	35	33	30	33	35	34	-

\*: Estimates of modified electricity consumption method. Source: Eilat and Zinnes (2002)

of money is equal for both the underground and official economies. Then he makes assumptions about the base year, when the level of underground economy is very low. Thus, the ratio of the value of total transactions and official GNP in that particular year is minimal and would have been unchanged over time.

The forth group of methods widely used in different countries is called currency demand approach. These methods are based on estimation of the demand for currency in the economy. The key assumption under this two methods is that the cash is the exclusive payment method in the shadow economy and therefore, by estimating the total demand for cash over some period of time it is possible to calculate the excess amount of cash used for the payments of economic transactions in the shadow economy. Both methods also assume that the main reason for the existence of the shadow economy is high tax rates and strict government policy in this area. These methods have been widely used in many developed countries of the world. In the next part of this paper we will use this method to estimate the shadow economy of Armenia for the period of 1994-2004.

Another interesting method for estimation of the size of the shadow economy is called Total Electricity Approach (Kaufam and Kaliberda, 1996). The difference between the changes in total electricity consumption and official GDP is the basis for the estimation in this method. It was used for estimating the size of the underground sectors of some transition economies. The elasticity of short run electricity-to-GDP ratio (official and underground) is said to be close to 1 (Johnson *et al.*, 1997). Any difference between total GDP and official measured GDP is the estimate of the size of the underground economy. This method was used for estimating the size of the shadow economies in 24 transition economies for the period of 1990-1994. Later in 2002 this method was modified by Eilat and Zinnes (2002) and new estimates of shadow economy for the period of 1995-1997 were presented for these transition economies (Table 1).

This method which is based on the data on electricity consumption is quite questionable, since the source data on electricity consumption in these sample countries, especially in early 1990s is not reliable. For example, in Armenia, because of energy crisis the real level of electricity production and consumption have been a controversial issue subject to public debates even until now. Therefore, one should be very cautious in interpreting and using estimates that are based on doubtful figures.

## **SHADOW ECONOMY OF ARMENIA: CAUSES AND CONSEQUENCES**

A simple definition of the shadow economy is that it is the part of the gross national product that, because of non-reporting and/or underreported is not included in the official statistics. It can also be defined as a part of the total GDP (official and unofficial) that has been left outside the official statistics because of other reasons, not necessary only for tax evasion.

In general the shadow activities can be divided into four main categories: (I) underreported or not-reported; (II) illegal; (III) unrecorded and (IV) household activities and barter transactions.

The major part of the shadow economy is assumed to involve those activities that were not recorded by the statistical services because of non-reporting or under reporting by business entities and citizens and the main indicator of this hidden part is the difference of the total tax revenues estimated on the real level of all economic activities (not the planned budget figures) and actually collected tax revenues by the state tax service. This part of the shadow economy is of particular interest because of the significant policy implications it can have.

Although the international experience and the academic literature suggest that the main reason for the existence of the shadow economy are high rates of taxes and other mandatory payments imposed by the government, however, in Armenia these have not been the only major factor contributing to the existence of shadow economy. On the contrary, the tax regime in Armenia is considered as lenient with relatively low tax rates. Widespread corruption and ineffective systems of accountability in the public sector have had largely contributed to the expansion of hidden economic activities in Armenia during the past decade. Corruption in the public sector has been one of the major factors that contributed to the growth of the shadow sector of the economy in Armenia. More corruption provides both incentives and reasons for the businesses to go underground.

One of the few studies on shadow sector of the transition economies also suggests that one of the main reasons for the companies to go underground is to avoid the burden of administrative regulations and taxations; institutional aspects and regulatory discretion play a greater role in expansion of the shadow economy (Kaufman and Kaiberda, 1996).

On the other hand, during the past ten years many of the government institutions were just being formed and there was no professional civil service or other special public services on place. All these provided favorable and not risky environment and conditions for public officials to look for corrupt practices that in many cases involved taking bribes or abusing the public offices for private gain. One of the few studies on shadow sector of the transition economies also suggests that one of the main reasons for the companies to go underground is to avoid the burden of administrative regulations and taxations; institutional aspects and regulatory discretion play a greater role in expansion of the shadow economy.

The tax regulations and bureaucracy in the Armenian state apparatus are so much complicated that some economic agents prefer going underground not only for evading taxes, but mostly for avoiding to enter the official state registry so that to save their time and energy. Third, payment of taxes in their full amounts puts the entities in a competitive disadvantage since their under reporting competitors pay less. Forth, usually regular payments of bribes to tax inspectors establishes special personal relationships between them and over some period of time and with the expansion of a particular business the underreported amount increases even more.

The next group of shadow economy involves illegal activities. It should be realized that taxes and mandatory payments are not the major reason for existence of some types of shadow activities. Even if there were no any taxes or regulations there would still be some part of economic activities, mostly illegal ones, which would have not been captured by the official statistics. Some of the economic agents and citizens are involved in production or trade of such products and services that are prohibited by

laws and various regulations, such as drugs, prostitution, trafficking and others. So, regardless of the tax regime and rates these illegal activities will not be reported and thus will be left out of the official statistics.

There are some economic activities that are not being captured because of the underdeveloped systems of national statistics, as well as low and ineffective information sharing between various state bodies, such as national statistical service, tax, customs, state pension fund and others. Better coordination and information sharing would limit the chances of leaving some economic transactions from national accounts. While this problem was very serious in the early stages of transition, however, today the national statistical service is quite developed and these unrecorded economic activities does not constitute a major part in the total shadow economy of Armenia.

The other group of the shadow economy includes those activities that are carried out using household activities and barter transactions. Some parts of the total economic activities are not included in the official statistics because of difficulties of their measurement and/or ineffective and underdeveloped mechanisms and tools used by the statistical service for collection of relevant information from all sectors of the economy. Although the concept of the gross national income suggests that the national accounts should involve all economic activities of the society, however the most of the values created by households are not measured and accounted in the national statistics.

Barter transactions are also left unrecorded in any official agency and statistics. This type of activities especially involving various agricultural products have been very popular particularly in the regions of Armenia. However, as it was with the unrecorded economic activities, barter transactions are very difficult to measure and they do not constitute a major policy issue to be much concerned with at this stage of Armenia's development.

There are several reasons why the existence of the shadow economy matters. First and foremost, economic policy measures can be misdirected and be of the wrong magnitude because of the measurement errors in economic indicators such as GDP, labor force and national income caused by the hidden economy. In addition the underground economy can also result in overestimation of unemployment and inflation. It is generally accepted that the shadow economy is mainly caused by high levels of tax rates, other forms of payments by the citizens and the existing cumbersome regulatory environment. Therefore, the growth of the underground economy may result in a decrease in tax revenues creating budget deficit problems. This is especially a significant issue for countries like Armenia, where, because of underdeveloped tax systems and difficulties associated with tax collection, the governments' fiscal positions are not strong. This is particularly true when we look at the overall tax collection ratio of Armenia (Table 2). As we can see it is the lowest among all CIS countries. Moreover, during the past four years there has been a negative trend of fall of collection of tax revenues, particularly income and profit taxes.

Another negative consequence of the shadow economy is that as it grows it attracts more and more people and thereby increases the demand for labor. This negatively impacts efficiency of the labor market in the official economy and distorts the resource allocation in the economy. In addition, widespread shadow activities negate the overall rule of law in Armenia, which is essential for its sustainable development. It also demolishes the moral of the citizens and fair economic players and worsens the distrust in the government.

In discussing these negative consequences of the shadow economy, we should also mention the positive role that it has played especially in the early stages of transition of the Armenian economy. Since independence in 1991 Armenia has experienced significant economic and social problems that were caused by various internal and external factors (blockade, energy shortage, war and others) that resulted in the increase of the poverty in the country. Under these circumstances during the early 1990s the government closed eyes on many shadow activities and adopted relatively mild policies

Table 2: Total government tax revenues in transition economies, percent of GDP (excluding budget grants and non-tax revenues)

Country	1996	1997	1998	1999	2000	2001	2002	2003
Armenia, excluding SIF	10.8	13.3	14.4	17.3	15.5	14.8	12.5	14.4
Georgia	10.7	12.7	12.8	13.8	14.2	18.0	NA	NA
Kyrgyz Republic	17.3	16.7	18.4	15.9	15.3	15.4	NA	NA
Kazakhstan	11.4	12.2	16.2	16.0	20.0	19.7	NA	NA
Azerbaijan	17.6	19.1	19.5	18.2	20.8	20.5	NA	NA
Moldova	27.4	29.9	28.3	21.8	22.3	23.0	NA	NA
Albania	18.3	16.6	20.3	21.3	22.4	22.5	NA	NA
Lithuania	29.6	32.6	32.6	32.1	30.2	28.5	NA	NA
Russia	22.5	33.0	28.6	28.8	31.3	30.9	NA	NA
Macedonia	35.7	34.7	33.2	34.2	35.2	38.5	NA	NA
Ukraine	36.7	38.0	36.0	33.4	35.6	32.8	NA	NA
Estonia	37.7	39.2	36.9	35.5	35.6	38.3	NA	NA
Latvia	37.4	39.9	43.9	40.8	37.0	38.7	NA	NA
Slovak Republic	45.3	42.8	40.5	41.6	39.2	34.4	NA	NA
Bulgaria	35.9	35.1	37.7	40.3	41.3	N/A	NA	NA
Croatia	48.9	47.6	50.8	47.7	45.2	38.2	NA	NA

NA: Not Available, Source: Armenia Public Expenditure Review, World Bank (2003)

towards the latter. However, with economic stabilization and development negative aspects of the shadow economy outweighed this positive social role and since 1998 the reduction of the size of the shadow economy has been a major part of Armenian government program.

### ESTIMATING THE SIZE OF THE UNDERGROUND ECONOMY USING GUTTMANN'S METHOD

Now we will try to estimate the size of the shadow economy of Armenia using the currency demand approach first introduced by Gutman in 1977. This currency demand approach has been applied in many countries of the world and is based around some key assumptions made about the ratio of currency in circulation to demand deposits ( $C/D$ ). In any country there is a period when the underground economy is at its minimal level. It is also believed that during the period with no or minimal underground economy the  $C/D$  ratio also takes its lowest magnitude. But the most critical assumption of this method is that the  $C/D$  ratio is constant over time and any change in that ratio is caused by the increase in the size of underground economy.

We have made several key assumptions under this method. First, it is assumed that during the period under consideration all transactions in the shadow economy of Armenia have been cash transactions. Second, the underground economy is the net result of high tax rates and restrictions imposed by government and that  $C/D$  ratio is influenced by the government rules and restrictions in the revenue mobilization area. Third, the average of the  $C/D$  ratio for the January-March, 1994 period is taken as normal assuming there was minimal underground economy in this base period. We assume there was no underground economy or at least its size was negligible in the early phase of introduction of the national currency. Before the introduction of the Armenian dram in November 1993, the Russian ruble was the official currency in circulation. When the national currency was introduced, the Central Bank of Armenia started to convert the Russian rubles into newly introduced drams under some fixed and strict procedures. This process took several months and was overall strictly controlled, which means that the money from the underground economy was not easy, at least in the early stages of this currency change, to transfer all the funds from rubles to drams. It would have taken longer periods, at least several months to allow all cash money used in the underground sector to be transformed into drams. Therefore, we assume that the  $C/D$  ratio at the beginning of 1994 reflected an economy with minimal level of underground activities. During January-March, 1994 the average of the  $C/D$  ratio was equal to 1.15, which is taken as the base (normal) number for our calculations.

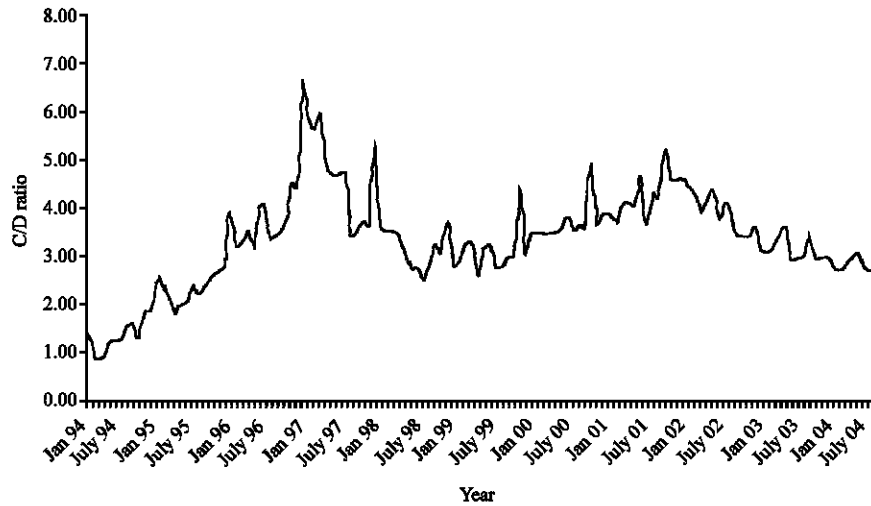


Fig. 1: Currency to demand deposit ratio (Jan 1994-July 2004) (Official data of the Central Bank of Armenia)

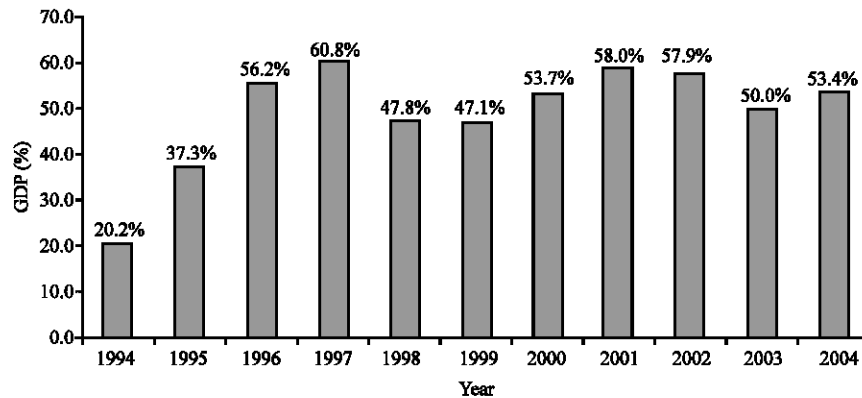


Fig. 2: The size of the shadow economy of Armenia using Gutman's Approach (1994-2004, percent of official nominal GDP of each year)

From Fig. 1 the C/D ratio has had very interesting fluctuations over the period under consideration. It reached its highest level (6.7) in December, 1996. The other interesting pattern of the C/D ratio is that it had its highest levels in December of every year. This speaks about the high demand for cash in the economy at the end of calendar year, which is overall in line with the economic processes.

For estimating the size of the shadow economy we first calculate the C/D ratio for each month of the period of January, 1994-November, 2004. Then we subtract the normal value of the C/D ratio (1.15) from the actual value of the ratio for each month and get the excess C/D ratio, which, under this method, was due to the underground economy. Third, we multiply the actual demand deposits of every month by the excess amount of the C/D ratio and get the amount of illegal currency used in the underground sector for each month. Fourth, we define the income velocity of money, defined as ratio GDP to M1. By multiplying the illegal money by the income velocity of money, we get estimates of the underground economy. Figure 2 summarizes the findings using Gutman's method for Armenia for the period of 1994-2004.



## **CONCLUSIONS**

It is important to realize that the shadow economy is present in almost every country of the world and it is very hard to measure its actual size. Besides its negative consequences (less collected revenues, deteriorated macroeconomic indicators and others), the shadow economy in Armenia has played a significant stabilizing role during the early years of independence as it provided a source of income for the population. It also stimulated economic activities and provided necessary entrepreneurial skills for the start-up businesses.

However, these estimates of the shadow economy of Armenia provide useful information about the development of underground economy over the past decade, which can be used for making relevant adjustments and changes in the economic and social policies. The huge underground sector for a country that has very high level of poverty means that the government does not fully and effectively carrying out its important functions of essential public services' delivery and creation of fair rules for economic completion.

One of the main directions for the government's fight against shadow economy should be the anti-corruption activities. The shadow economy and anticorruption are interrelated; on one hand the existence of the shadow economy promotes the corruption in tax authorities, on the other hand because of corruption, there is an increase in shadow activities. So, the government and the society should combine their efforts in carrying out effective anti-corruption program, that would also result in the decrease of the size of the shadow economy. Further modernization of tax and customs administrations, by strengthening and improving the professional tax and customs services and developing ethical standards of tax and customs officers with some strict mechanisms of control, can have significant impact on the size of the shadow economy.

We would suggest that the major reason for existence of the shadow sector in the economy in Armenia is the relatively easy and not risky possibility of tax avoidance. Today it is too easy to hide and too easy to avoid any punishment and many economic entities prefer to get as much benefit from working underground, as possible, since they know that if caught there are easy and quick ways of solving their problems.

Unfair and unequal tax administration is another major reason for the existence of shadow economy. Many business entities are hiding their activities in order of being able to compete with those who enjoy the protection of various tax and state officials. The unfair tax administration, unequal treatment and discretionary use of tax code are also highlighted in the recent FIAS report (Anonymous, 2004a) as the main problems for the investors. Therefore, as recommended in the report the government should develop right and fair mechanisms for incentives in tax administration, provide better information sharing among various state bodies.

More improved information and effective information sharing mechanisms between various state institutions, such as the tax, customs, state pension fund, statistics service, control agencies, would allow to better monitor and capture all economic transactions carried out in various sectors of the economy. The recent decision of the Armenian government to transfer the administration authority for collection of state pension fund payments to State Tax Service is aimed towards the above objective.

## **REFERENCES**

- Aigner, D., F. Schneider and D. Ghosh, 1988. Me and my shadow: Estimating the size of the US hidden economy from time series data. *Dynamic Econometric Modeling*.
- Anonymous, 2003. Armenia-poverty reduction strategy paper. Chapter 6.3.2, para 196, Yerevan.
- Anonymous, 2004a. Assessment of administrative procedures for doing business in Armenia. FIAS, The World Bank.

- Anonymous, 2004b. Armenia-medium term expenditure framework. Yerevan, Armenia, pp: 27.
- Eilat, Y. and C. Zinnes, 2002. The shadow economy in transition countries: Friend or foe? A Policy Perspective, USA.
- Feige, E., 1990. Defining and estimating underground and informal economies: The new institutional economies approach. *World Development*, 18: 989-1002.
- Johnson, Kaufman and Shleifer, 1997. The Unofficial Economy in Transition. *Brookings Papers of Economic Activity*, pp:159-221.
- Kaufman, D. and A. Kaiberda, 1996. Integrating the unofficial economy into the dynamics of post-socialist economies: A framework of analysis and evidence. *Economic Transition in the Newly Independent States* (Kaminski), Armonk, New York.
- Park, T., 1979. Reconciliation between personal income and taxable income, 1947-1977. Mimeo, Washington DC: Bureau of Economic Analysis.