

THE DEVELOPMENT OF THE SHADOW ECONOMIES AND SHADOW LABOR FORCE OF 22 TRANSITION AND 21 OECD COUNTRIES:

by

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1 Introduction

As crime and other underground economic activities (including shadow economic ones) are a fact of life around the world, most societies attempt to control these activities through various measures like punishment, prosecution, economic growth or education. Gathering statistics about who is engaged in underground (or crime) activities, the frequencies with which these activities are occurring and the magnitude of them, is crucial for making effective and efficient decisions regarding the allocations of a country's resources in this area. Unfortunately, it is very difficult to get accurate information about these underground (or as a subset shadow economy) activities in terms of value added and of labor market, because all individuals engaged in these activities wish not to be identified.¹⁾

2 The Definition of a Shadow Economy

Most authors trying to measure the shadow economy face the difficulty of how to define it. One commonly used working definition is: all currently unregistered economic activities which contribute to the officially calculated (or observed) Gross National Product.²⁾ Smith (1985, p. 18) defines it as „market-based production of goods and services, whether legal or illegal that escapes detection in the official estimates of GDP.“ As these definitions still leave open a lot of questions, table 1 may be helpful for developing a better feeling for what could be a reasonable consensus definition of the legal and illegal underground or shadow economy. From table 1 it becomes clear that the shadow economy includes unreported income from the production of legal goods and services either from monetary or barter transactions - hence all economic activities which would generally be taxable were they reported to the state (tax) authorities.

¹⁾ The scientific fascination of the underground economy has inspired many scientists (like me) to tackle this difficult question and undertake the challenging task to estimate the shadow economy in Transition and OECD-countries over the 90s.

²⁾ This definition is used for example, by Feige (1989, 1994), Schneider (1994a), Frey and Pommerehne (1984), and Lubell (1991).

Table 1: A Taxonomy of Types of Underground Economic Activities¹⁾

Type of Activity	Monetary Transactions		Non Monetary Transactions	
Illegal Activities	Trade with stolen goods; drug dealing and manufacturing; prostitution; gambling; smuggling and fraud		Barter of drugs, stolen goods, smuggling etc. Produce or growing drugs for own use. Theft for own use.	
	Tax Evasion	Tax Avoidance	Tax Evasion	Tax Avoidance
Legal Activities	Unreported income from self-employment; Wages, salaries and assets from unreported work related to legal services and goods	Employee discounts, fringe benefits	Barter of legal services and goods	All do-it-yourself work and neighbor help

¹⁾ Structure of the table is taken from Lippert and Walker (1997, p. 5) with additional remarks.

3 The Size of the Shadow Economies (Labor Force) in 22 Transition and 21 OECD Countries

3.1 22 Transition Countries

The physical input (electricity) method and DYMIMIC (Dynamic Multiple Indicator Multiple Causes Approach)³⁾ method have been applied to the transition countries in Central and Eastern Europe and to states of the former Soviet Union. The results are shown in table 2 and in figure 2.1 to 2.4; they cover the periods 1990-93, 1994-95 and 2000/2001. Considering the physical input method by Johnson et. al and the countries of the former Soviet Union over the period 1990–93, Georgia has the largest shadow economy with 43.6 percent of “official” GDP, followed by Azerbaijan with 33.8 percent and Moldova 29.1 percent. Russia can be found in middle with a shadow economy of 27 percent. According to the Johnson et. al. Figures Belarus with 14 percent and Uzbekistan with 10.3 percent have the smallest values. Except Uzbekistan all other former Soviet Union countries experienced a strong increase in the shadow economy from an average of 25.7 percent for 1990-93 to 35.3 percent for 1994–95, calculated over all 12 countries of the former Soviet Union. Turning to the transition countries of Central and Eastern Europe and considering the period 1990-93 and the Johnson et. al. figures Hungary has the largest shadow economy with 30.7 percent of GDP followed by Bulgaria with 26.3 percent. The lowest two are the Czech Republic with 13.4% and Slovakia with 14.2%. The Johnson et. al figures show an average shadow economy of the

Central and Eastern European states of 22.4% over 1990-93 and over the period 1994-95 Johnson et. al. shows an average size of the shadow economy of the Central and Eastern European states of 25.1%. Turning to the size of the shadow economy, estimated by the DYMIMIC method for the 13 former Soviet Union countries the average size is 32.9% and for the 9 Central and Eastern European countries the average size is 23.4 for the year 1990/93. Both values are in similar range compared with the ones of the physical input method and most single country estimates come quite close to the one estimated by Johnson et.al. (1997). Considering the years 2000/2001, Georgia has the largest shadow economy with 66.1% of official GDP, followed by Azerbaijan with 60.1% of “official” GDP and Ukraine with 51.2% of official GDP. The lowest shadow economy on the Former Soviet Union countries has Uzbekistan with 33.4% of official GDP and Kyrgyzstan with 39.4% of official GDP and Latvia with 39.6% of official GDP. On average the shadow economy has reached the value of 44.8% of official GDP for the years 2000/2001 which is a considerable increase compared to the average of the years 1990/1993. If we turn now to the Central and Eastern Europe, we see that in the years 2000/2001 again using the DYMIMIC method Macedonia has with 45.1% of official GDP the largest shadow economy followed by Bulgaria with 36.4% of official GDP and Romania with 33.4% of official GDP. The smallest has Slovakia with 18.3% of official GDP and the Czech Republic with 18.4% of official GDP. The average size of the shadow economy in the 9 Central and Eastern European Transition Countries has increased from 23.4% (of official GDP) of the years 1990/93 to 29.2% (of official GDP) of the years 2000/2001. If we finally discuss the size of the shadow economy labor force in percent of the population, we see of the Former Soviet Union Transition Countries, Georgia has with 53.2% the biggest shadow economy labor force, followed by Azerbaijan with 50.7% and Ukraine with 41.2%. The lowest has Lithuania with 20.3% and Kyrgyzstan with 29.4%. Turning to the Central and Eastern Europe, considering here the shadow economy labor force, we see that the Czech Republic has with 12.6% the lowest, followed by Slovakia with 16.3% and the largest has Macedonia with 35.1%, followed by Bulgaria with 30.4% and Croatia with 27.4%. In general, the size of the shadow economy and also the size of the shadow economy labor force is quite remarkable for this 22 Transition countries and has strangely risen up to the year 2000/2001.

³⁾ These and other estimation procedures are described in detail in Schneider and Enste (2000).

Table 2: The Size of the Shadow Economy in Transition Countries					
Transition Countries	Size of the Shadow Economy (in % of GDP)				Shadow Economy Labor Force in % of (Working Age) ¹⁾ Population 1998/99
	Physical Input (Electricity) Method Using Values from Johnson et. al. (1997)		DYMIMIC Method		
	Average 1990-93	Average 1994-95	Average 1990-93	Average 2000/01	
Former Soviet Union					
1. Armenia	39.4	40.3	40.1	45.3	40.3
2. Azerbaijan	43.8	59.3	45.1	60.1	50.7
3. Belarus	34.0	39.1	35.6	47.1	40.9
4. Estonia	33.9	38.5	34.3	39.1	33.4
5. Georgia	43.6	63.0	45.1	66.1	53.2
6. Kazakhstan	32.2	34.2	31.9	42.2	33.6
7. Kyrgyzstan	34.1	37.2	35.2	39.4	29.4
8. Latvia	24.3	34.8	25.7	39.6	29.6
9. Lithuania	26.0	25.2	26.0	29.4	20.3
10. Moldavia	29.1	37.7	29.3	44.1	35.1
11. Russia	27.0	41.0	27.8	45.1	40.9
12. Ukraine	38.4	47.3	29.4	51.2	41.2
13. Uzbekistan	20.3	28.0	22.1	33.4	33.2
<i>Unweighted Average: former Soviet Union Countries</i>	<i>32.8</i>	<i>40.4</i>	<i>32.9</i>	<i>44.8</i>	<i>37.1</i>
Central and Eastern Europe					
1. Bulgaria	26.3	32.7	27.1	36.4	30.4
2. Croatia	23.5	28.5	24.6	32.4	27.4
3. Czech Republic	13.4	14.5	13.1	18.4	12.6
4. Hungary	20.7	28.4	22.3	24.4	20.9
5. Macedonia	34.5	40.3	35.6	45.1	35.1
6. Poland	20.3	13.9	22.3	27.4	20.9
7. Romania	26.0	28.3	27.3	33.4	24.3
8. Slovakia	14.2	15.2	15.1	18.3	16.3
9. Slovenia	22.4	23.9	22.9	26.7	21.6
<i>Unweighted Average: Central and Eastern European Countries</i>	<i>22.4</i>	<i>25.1</i>	<i>23.4</i>	<i>29.2</i>	<i>23.3</i>

1) Working age population means population between the age of 16 and 65.

Sources: Own calculations using the DYMIMIC method and values using the Physical input method are from Johnson, Kaufmann, and Shleifer (1997, table 1, p. 182-183), Johnson, Kaufmann, and Zoida-Lobaton (1998a, p. 351).

3.2 21 OECD countries

For the 21 OECD countries either the currency demand method or the DYMIMIC method are used to estimate the size of the shadow economy. The results for these countries are shown in table 3 and in figures 3.1 to 3.3 over the period 1989/90 to 2000/2001. Considering again the latest period 2000/2001, Greece has with 28.5% of “official” GDP the largest shadow economy, followed by Italy with 27.0% and Portugal with 22.5%. In the middle-field are Germany with a shadow economy of 16.3% of “official” GDP, followed by Ireland with 15.7% and France with 15.0% of official GDP. At the lower end are Austria with 10.6% of “official” GDP, Switzerland with 9.4% of “official” GDP and the United States with 8.7% of “official” GDP. In OECD countries one realizes an increase of the shadow economies during the 90s. On average the shadow economy was 13.2% in these 21 OECD states in the year 1989/90 and it rose to 16.7% in the year 2001/2002. That is an increase by 3.5 percentage points. But we can also see that this increase is considerably smaller compared to the one of 22 Transition countries with 9.9 percentage points of “official” GDP (over the same period). If we consider the second half of the 90s, we realize that for 14 out of the 21 OECD countries the shadow economy is not further increasing, even slightly decreasing, like for Belgium from 22.5% (1997/98) to 22.0% (2001/2002), for Denmark from 18.3% (1997/98) to 17.9% (2001/2002) or for Finland from 18.9% (1997/98) to 18.0% (2001/2002). 6 out of the 21 OECD countries, like New Zealand, it is still increasing from 11.9% (1997/98) to 12.6% (2001/2002), or Germany from 14.9% (1997/98) to 16.3 (2001/2002) or Austria from 9.0% (1997/98) to 10.6% (2001/2002). Hence, one draw the conclusion that for 14 out of 21 countries the shadow economy is slightly decreasing at the end of the 90s. The decrease differs from country to country but in some countries some efforts have been made to stabilize (or to decrease) the size of the shadow economy and in other countries (like Germany) these efforts were not successfully.

Table 3: The Size of the Shadow Economy in OECD Countries							
OECD-Countries	Size of the Shadow Economy (in % of GDP) using the Currency Demand Method						
	Average 1989/90	Average 1991/92	Average 1994/95	Average 1997/98	Average 1999/2000	Average 2001/2002¹⁾	Increase (+) or Decrease of the shad. econ. (-) from 1997/98 to 2001/02
1. Australia	10.1	13.0	13.5	14.0	14.3	14.1	+0.1
2. Austria	6.9	7.1	8.6	9.0	9.8	10.6	+1.6
3. Belgium	19.3	20.8	21.5	22.5	22.2	22.0	-0.5
4. Canada	12.8	13.5	14.8	16.2	16.0	15.8	-0.4
5. Denmark	10.8	15.0	17.8	18.3	18.0	17.9	-0.4
6. Finland	13.4	16.1	18.2	18.9	18.1	18.0	-0.9
7. France	9.0	13.8	14.5	14.9	15.2	15.0	+0.1
8. Germany	11.8	12.5	13.5	14.9	16.0	16.3	+1.4
9. Great Britain	9.6	11.2	12.5	13.0	12.7	12.5	-0.5
10. Greece	22.6	24.9	28.6	29.0	28.7	28.5	-0.5
11. Ireland	11.0	14.2	15.4	16.2	15.9	15.7	-0.5
12. Italy	22.8	24.0	26.0	27.3	27.1	27.0	-0.3
13. Japan	8.8	9.5	10.6	11.1	11.2	11.1	0.0
14. Netherlands	11.9	12.7	13.7	13.5	13.1	13.0	-0.5
15. New Zealand²⁾	9.2	9.0	11.3	11.9	12.8	12.6	+0.7
16. Norway	14.8	16.7	18.2	19.6	19.1	19.0	-0.6
17. Portugal	15.9	17.2	22.1	23.1	22.7	22.5	-0.6
18. Spain³⁾	16.1	17.3	22.4	23.1	22.7	22.5	-0.6
19. Sweden	15.8	17.0	19.5	19.9	19.2	19.1	-0.8
20. Switzerland	6.7	6.9	7.8	8.1	8.6	9.4	+1.3
21. USA	6.7	8.2	8.8	8.9	8.7	8.7	-0.2
Unweighted Average over 21 OECD countries	13.2	14.3	15.7	16.7	16.8	16.7	-0.01

Sources: Currency demand approach, own calculations

1) Preliminary values.

2) The figures are calculated using the MIMIC-method and Currency demand approach. Source: Giles (1999b).

3) The figures have been calculated for 1989/90, 1990/93 and 1994/95 from Mauleon (1998) and for 1997/98, 1999/2000 and 2001/2002 own calculations.

4 The Main Causes of the Increase of the Shadow Economy

4.1 Increase of the Tax and Social Security Contribution Burdens

In almost all studies⁴⁾ it has been found out, that the increase of the tax and social security contribution burdens is one of the main causes for the increase of the shadow economy. Since taxes affect labor-leisure choices, and also stimulate labor supply in the shadow economy, or the untaxed sector of the economy, the distortion of this choice is a major concern of economists. The bigger the difference between the total cost of labor in the official economy and the after-tax earnings (from work), the greater is the incentive to avoid this difference and to work in the shadow economy. Since this difference depends broadly on the social security system and the overall tax burden, they are key features of the existence and the increase of the shadow economy. But even major tax reforms with major tax rate deductions will not lead to a substantial decrease of the shadow economy. They will only be able to stabilize the size of the shadow economy and avoid a further increase. Social networks and personal relationships, the high profit from irregular activities and associated investments in real and human capital are strong ties which prevent people from transferring to the official economy. For Canada, Spiro (1993) expected similar reactions of people facing an increase in indirect taxes (VAT, GST). After the introduction of the GST in 1991 - in the midst of a recession - , the individuals suffering economic hardship because of the recession turned to the shadow economy, which led to a substantial loss in tax revenue. "Unfortunately, once this habit is developed, it is unlikely that it will be abandoned merely because economic growth resumes." (Spiro 1993 p. 255). They may not return to the formal sector, even in the long run. This fact makes it even more difficult for politicians to carry out major reforms because they may not gain a lot from them.⁵⁾

In neoclassical models the most important factor is the marginal tax rate. The higher the marginal tax rate, the greater is the substitution effect and the bigger the distortion of the labor-leisure decision. Especially when taking into account that the individual can also receive income in the shadow economy, the substitution effect is definitely larger than the

⁴⁾ See Thomas (1992); Lippert and Walker (1997); Schneider (1994a, 1994b, 1997, 1998, 2001); Johnson, Kaufmann, and Zoido-Lobaton (1998a,1998b); Tanzi (1999) and Giles (1999a) just to quote a few recent ones.

⁵⁾See Schneider (1994b, 1998) for a similar result of the effects of a major tax reform in Austria on the shadow economy. Schneider shows that a major reduction in the direct tax burden did not lead to a major reduction in the shadow economy. Because legal tax avoidance was abolished and other factors, like regulations, were not changed; hence for a considerable part of the tax payers the actual tax and regulation burden remained unchanged.

income effect⁶⁾ and, hence, the individual works less in the official sector. The overall efficiency of the economy is, therefore (*ceteris paribus*) lower and the distortion leads to a welfare loss (according to official GNP and taxation.) But the welfare might also be viewed as increasing, if the welfare of those, who are working in the shadow economy, were taken into account, too.⁷⁾

Empirical results of the influence of the tax burden on the shadow economy is provided in the studies of Schneider (1994b, 2000) and Johnson, Kaufmann and Zoido-Lobaton (1998a, 1998b); they all found strong evidence for the general influence of taxation on the shadow economy. This strong influence of indirect and direct taxation on the shadow economy will be further demonstrated by discussing empirical results in the case of Austria and the Scandinavian countries. For Austria the driving force for the shadow economy activities is the direct tax burden (including social security payments), it has the biggest influence, followed by the intensity of regulation and complexity of the tax system. A similar result has been achieved by Schneider (1986) for the Scandinavian countries (Denmark, Norway and Sweden). In all three countries various tax variables (average direct tax rate, average total tax rate (indirect and direct tax rates)) and marginal tax rates have the expected positive sign (on currency demand) and are highly statistically significant. Similar results are reached by Kirchgaessner (1983, 1984) for Germany and by Kloveland (1984) for Norway and Sweden.

Several other recent studies provide further evidence of the influence of income tax rates on the shadow economy: Cebula (1997), using Feige data for the shadow economy, found evidence of the impact of government income tax rates, IRS audit probabilities, and IRS penalty policies on the relative size of the shadow economy in the United States. Cebula concludes that a restraint of any further increase of the top marginal income tax rate may at least not lead to a further increase of the shadow economy, while increased IRS audits and penalties might reduce the size of the shadow economy. His findings indicate that there is generally a strong influence of state activities on the size of the shadow economy: For example, if the marginal federal personal income tax rate increases by one percentage point, *ceteris paribus*, the shadow economy rises by 1.4 percentage points. In another investigation, Hill and Kabir (1996) found empirical evidence that marginal tax rates are more relevant than average tax rates, and that a substitution of direct taxes by indirect taxes seems unlikely to improve tax compliance.

⁶⁾If leisure is assumed to be a normal good.
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4.2 Intensity of Regulations

The increase of the intensity of regulations (often measured in the numbers of laws and regulations, like licenses requirements) is another important factor, which reduces the freedom (of choice) for individuals engaged in the official economy.⁸⁾ One can think of labor market regulations, trade barriers, and labor restrictions for foreigners. Johnson, Kaufmann, and Zoido-Lobaton (1998b) find an overall significant empirical evidence of the influence of (labor) regulations on the shadow economy, the impact is clearly described and theoretically derived in other studies, e.g. for Germany (Deregulation Commission 1990/91). Regulations lead to a substantial increase in labor costs in the official economy. But since most of these costs can be shifted on the employees, these costs provide another incentive to work in the shadow economy, where they can be avoided. Empirical evidence supporting the model of Johnson, Kaufmann, and Shleifer (1997), which predicts, *inter alia*, that countries with more general regulation of their economies tend to have a higher share of the unofficial economy in total GDP, is found in their empirical analysis. A one-point increase of the regulation index (ranging from 1 to 5, with 5 = the most regulation in a country), *ceteris paribus*, is associated with an 8.1 percentage point increase in the share of the shadow economy, when controlled for GDP per capita (Johnson et. al. (1998b), p. 18). They conclude that it is the enforcement of regulation, which is the key factor for the burden levied on firms and individuals, and not the overall extent of regulation - mostly not enforced - which drive firms into the shadow economy. Friedman, Johnson, Kaufmann and Zoido-Lobaton (1999) reach a similar result. In their study every available measure of regulation is significantly correlated with the share of the unofficial economy and the sign of the relationship is unambiguous: more regulation is correlated with a larger shadow economy. A one point increase in an index of regulation (ranging from 1-5) is associated with a 10 % increase in the shadow economy for 76 developing, transition and developed countries.

These findings demonstrate that governments should put more emphasis on improving enforcement of laws and regulations, rather than increasing their number. Some governments, however, prefer this policy option (more regulations and laws), when trying

⁷⁾See Thomas (1992) p. 134-7.

⁸⁾See for a (social) psychological, theoretical foundation of this feature, Brehm (1966, 1972), and for a (first) application to the shadow economy, Pelzmann (1988).

to reduce the shadow economy, mostly because it leads to an increase in power of the bureaucrats and to a higher rate of employment in the public sector.

5 Summary and Conclusions

There are many obstacles to be overcome to measure the size of the shadow economy (either in value added and/or in the labor force units) and to analyze its consequences on the official economy, although some progress has been made. In this paper has been shown that though it is difficult to estimate the size of the shadow economy, it is not impossible. It has been demonstrated that with various methods, e.g. the currency demand and the model approach, some insights can be provided into the size and development of the shadow economy (labor force) of 22 Transition and 21 OECD countries. The general impression from the results of these estimations is that for all countries investigated the shadow economy (labor force) has reached a remarkably large size. Over 2000/2001 on average the shadow economy in terms of value added (labor force) was 38% (30.2%) in the 22 Transition and 16.7% (15.3%) of official GDP in the 21 OECD countries.

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