

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

FRIEDRICH SCHNEIDER*

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 criminal) activities, the frequencies with which these activities occur and their magnitude, 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 the labour market, because those engaged in these activities seek anonymity un.¹

Definition of a shadow economy

Most authors trying to measure the shadow economy face the difficulty of how to define it. One com-

monly 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 if they were reported to the state (tax) authorities.

Size of the shadow economies (labour force) in 22 transition and 21 OECD countries

Twenty-one OECD countries

For the 21 OECD countries either the currency demand method or the DYMIMIC (Dynamic Multiple Indicator Multiple Causes Approach) method are used to estimate the size of shadow economies.³ The results for these countries are shown in Table 2 and in Figure1 over the period 1989/90 to 2000/01. Considering again the latest period, 2000/01, Greece has the largest shadow economy with 28.5 percent of "official" GDP, followed by Italy with 27.0 percent and Portugal with 22.5 percent. In the middle-field are Germany with a shadow economy of 16.3 percent of "official" GDP, followed by

* Professor Dr. Friedrich Schneider, Department of Economics, Johannes Kepler University of Linz, Altenbergerstrasse 69, A-4040 Linz-Auhof, Austria. Phone: 0043-70-2468-8210, Fax: 0043-70-2468-8209. E-mail: friedrich.schneider@jku.at, http://www.economics.uni-linz.ac.at/Members/Schneider/default.htm

¹ The scientific fascination of the underground economy has inspired many scientists (like me) to tackle this difficult question and undertake the challenging task of estimating the shadow economy in transition and OECD countries in the 1990s.

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

³ These and other estimation procedures are described in detail in Schneider and Enste (2000, 2002).

Table 1

A taxonomy of types of underground economic activities^{a)}

Type of activity	Monetary transactions		Non-monetary transactions	
Illegal activities	Trade with stolen goods; drug dealing and manufacturing; prostitution; gambling; smuggling and fraud		Bartering of drugs, stolen goods, smuggling etc. Produce or growing drugs for personal use. Theft for personal 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 neighbour help

^{a)} Structure of the table is based on Lippert and Walker (1997, p. 5).

Table 2

Size of the shadow economy in OECD countries

OECD-Countries	Size of the shadow economy (in % of GDP) using the currency demand method						Increase (+) or decrease of the shad. econ. (-) from 1997/98 to 2001/02
	Average 1989/90	Average 1991/92	Average 1994/95	Average 1997/98	Average 1999/2000	Average 2001/02 ^{a)}	
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 Zealand ^{b)}	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. Spain ^{c)}	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

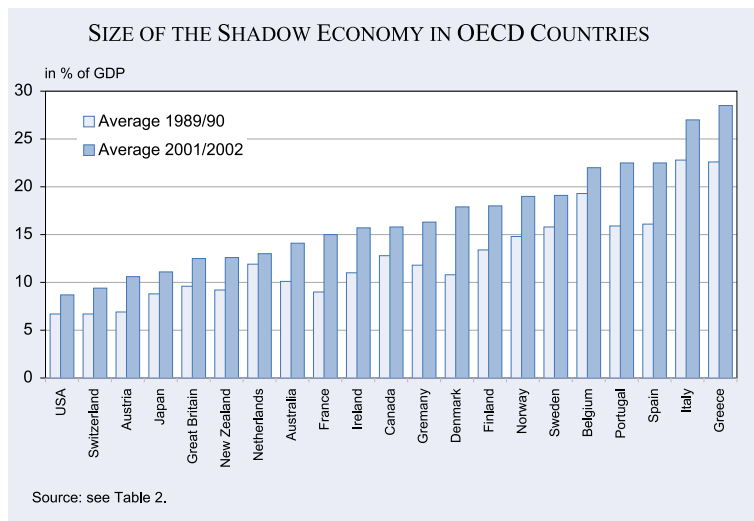
^{a)} Preliminary values.
^{b)} The figures are calculated using the MIMIC-method and currency demand approach. Source: Giles (1999b).
^{c)} The figures have been calculated for 1989/90, 1990/93 and 1994/95 in Mauleon (1998); for 1997/98, 1999/2000 and 2001/2002 my own calculations were used.

Sources: Currency demand approach, own calculations.

Ireland with 15.7 percent and France with 15.0 percent of official GDP. At the lower end are Austria with 10.6 percent of “official” GDP, Switzerland with 9.4 percent of “official” GDP and the United States with 8.7 percent of “official” GDP. In OECD countries an increase of the shadow economies during the 1990s can be observed. On average, the shadow economy was 13.2 percent in these 21 OECD states in 1989/90 and it rose to 16.7 percent in 2001/2002. That is an increase of 3.5 percentage points. But we can also see that this increase was considerably smaller compared to that of 22 transition countries with an increase of 9.9 percentage points of “official” GDP (over the same period). If we consider the second half of the 1990s, we realize that for 14 out of the 21 OECD countries the shadow

economy was not increasing, but even slightly decreasing, for example Belgium from 22.5 percent (1997/98) to 22.0 percent (2001/2002), for Denmark from 18.3 percent (1997/98) to 17.9 percent (2001/2002) or for Finland from 18.9 percent

Figure 1



(1997/98) to 18.0 percent (2001/2002). For 6 of the 21 OECD countries, like New Zealand, it was still increasing, from 11.9 percent (1997/98) to 12.6 percent (2001/2002), or Germany from 14.9 percent (1997/98) to 16.3 percent (2001/2002) or Austria from 9.0 percent (1997/98) to 10.6 percent (2001/2002). Hence, for 14 of 21 OECD countries the shadow economy was decreasing slightly at the end of the 1990s. The decrease differs from country to country; in some countries efforts have been made to stabilize (or to decrease) the size of the shadow economy and in other countries (like Germany) these efforts were apparently not successful.

Twenty-two transition countries

The physical input (electricity) method and DYMIMIC method have been applied to the tran-

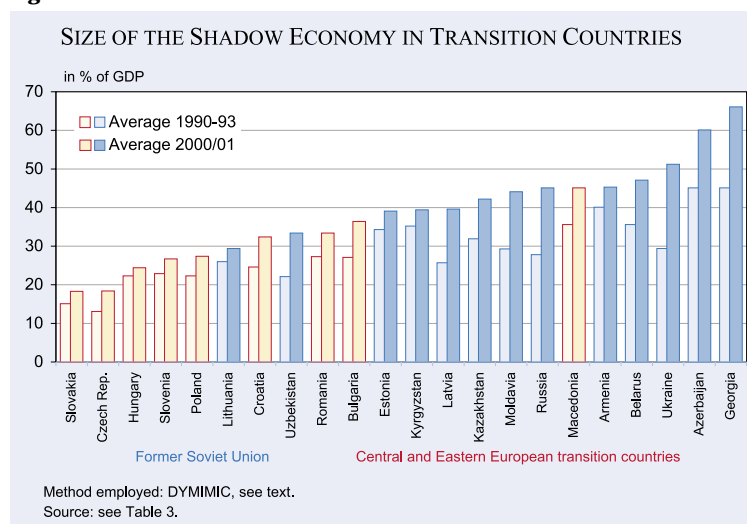
sition countries in Central and Eastern Europe and to states of the former Soviet Union. The results are shown in Table 3 and in Figure 2, covering the periods 1990–93, 1994–95 and 2000/01. Considering the physical input method by Johnson et al. and the countries of the former Soviet Union over the period 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 the middle with a shadow economy of 27 percent. According to the Johnson et al. figures, Belarus and Uzbekistan have the smallest values with 14 percent and 10.3 percent, respectively. 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

Table 3

Size of the shadow economy in transition countries

Transition countries	Size of the shadow economy (in % of GDP)				Shadow economy labour force in % of (working age) ^{a)} 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>
^{a)} 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-Lobatón (1998a, p. 51).					

Figure 2



percent for 1994–95, calculated for all 12 countries of the former Soviet Union. Turning to the transition countries of Central and Eastern Europe for 1990–93 and including 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 percent and Slovakia with 14.2 percent. The Johnson et. al figures show average shadow economies of 22.4 percent in the Central and Eastern European states for 1990–93 and 1994–95. Johnson et. al. show average shadow economies of 25.1 percent in the Central and Eastern European countries. Turning to the size of shadow economies estimated by the DYMIMIC method for the 13 former Soviet Union countries, the average size is 32.9 percent and for the nine Central and Eastern European countries the average size is 23.4 for 1990–93. Both values are similar compared with the ones calculated by the physical input method, and most single country estimates come quite close to the one estimated by Johnson et.al. (1997). For 2000/01 Georgia has the largest shadow economy with 66.1 percent of the “official” GDP, followed by Azerbaijan with 60.1 percent and Ukraine with 51.2 percent. The country with the smallest shadow economy amongst those of the Former Soviet Union is Uzbekistan with 33.4 percent of official GDP and Kyrgyzstan with 29.4 percent and Latvia with 39.6 percent. On average the shadow economies have reached 44.8 percent of official GDP for 2000/01 which is a considerable increase compared to the average of 1990/93. If we turn now to Central and Eastern Europe, we see that in the years 2000/01, again using the DYMIMIC method, Macedonia has the largest shadow

economy with 45.1 percent of official GDP, followed by Bulgaria with 36.4 percent of official GDP and Romania with 33.4 percent. Slovakia has the smallest shadow economy with 18.3 percent of official GDP and the Czech Republic with 18.4 percent. The average size of the shadow economy in the nine Central and Eastern European transition countries has increased from 23.4 percent (of official GDP) in 1990–93 to 29.2 percent (of official GDP) in 2000/01. If we finally discuss the size of the shadow economy labour force in percent of the

population, we see that amongst the Former Soviet Union transition countries, Georgia has the biggest shadow economy labour force with 53.2 percent, followed by Azerbaijan with 50.7 percent and the Ukraine with 41.2 percent. Lithuania has the lowest with 20.3 percent and Kyrgyzstan with 29.4 percent. Turning to Central and Eastern Europe, we see that the Czech Republic has the smallest shadow economy labour force with 12.6 percent, followed by Slovakia with 16.3 percent, and Macedonia has the largest with 35.1 percent, followed by Bulgaria with 30.4 percent and Croatia with 27.4 percent. In general, the size of the shadow economies and also that of the shadow economy labour forces is quite remarkable for these 22 transition countries and, has continued to increase up to 2000/01.

Main causes of the increase of the shadow economy

Increase of tax and social security contribution burdens

In almost all studies⁴ it has been determined that the increase of tax and social security contributions is one of the main causes for the increase in the shadow economy. Since taxes affect labour-leisure choices and also stimulate labour supply in the shadow economy, or the untaxed sector of 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 studies.

economy, the distortion of this choice is a major concern for economists. The bigger the difference between the total cost of labour in the official economy and 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 shadow economy and its growth. But even major tax reforms with considerable tax rate deductions will not lead to a substantial decrease in the shadow economy. These measures will only be able to stabilise the size of the shadow economy and prevent 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. In Canada, Spiro (1993) expected similar reactions for 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 is, the more significant the substitution effect and the greater the distortion of the labour-leisure decision. Especially when taking into account that the individual can also receive income in the shadow economy, the substitution effect is definitely greater than the 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. The strong influence of indirect and direct taxation on the shadow economy will be further demonstrated by discussing empirical results in Austria and the Scandinavian countries. For Austria the major driving force for the shadow economy activities is the direct tax burden (including social security payments), followed by the intensity of regulation and complexity of the tax system. A similar result has been determined 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 had the expected positive effect (on currency demand) and are highly statistically significant. Similar results have been obtained by Kirchgaessner (1983, 1984) for Germany and by Klovland (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 in the top marginal income tax rate may at least not lead to a further increase in 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.

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, for a considerable number of tax payers the actual tax and regulation burden remained unchanged.

⁶ If leisure is assumed to be a normal good.

⁷ See Thomas (1992) p. 134-7.

Intensity of regulations

The increase in 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 Examples are about market regulations, trade barriers, and labour restrictions for foreigners. Johnson, Kaufmann and Zoido-Lobaton (1998b) find overall significant empirical evidence of the influence of (labour) 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 labour costs in the official economy. But since most of these costs can be shifted to the employees, these costs provide another incentive to work in the shadow economy, where they can be avoided. The model of Johnson, Kaufmann and Shleifer (1997), which predicts, inter alia, that countries with more general regulations of their economies tend to have a higher share of the unofficial economy in total GDP, is supported by their empirical analysis. A one-point increase in 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 conclusion. In their study every available measure of regulation is significantly correlated with the share of the unofficial economy and the nature 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 percent 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.

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

Some governments, however, prefer this policy option (more regulations and laws) when trying to reduce the shadow economy, largely because it leads to an increase in power of the bureaucrats and to a higher rate of employment in the public sector.

Summary and Conclusions

There are many obstacles to overcome in measuring the size of the shadow economy (either in value added and/or in labour force units) and in analysing its consequences on the official economy, although some progress has been made. This paper has 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 (labour force) of 210 OECD and 22 transition countries. The general impression from the results of these estimations is that for all countries investigated the shadow economy (labour force) has reached a remarkably large size. In 2000/01, on average, the shadow economy in terms of value added (labour force) was 16.7 percent (15.3 percent) of official GDP in the 21 OECD and 38 percent (30.2 percent) in the 22 transition countries.

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