

Reducing the Shadow Economy in Germany: A Blessing or a Curse?*)

by

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Abstract:

The size and development of the shadow economy of Germany is estimated, using various estimation procedures. An increased burden of taxation and social security payments, combined with intensive labor market regulation, quality of state institutions and the tax morale are the driving forces for the shadow economy. Moreover, the results of recent surveys for Germany demonstrate, that the readiness to undertake illicit employment as well as its acceptance are high in Germany and other countries. Finally, conclusions are made about the effect of the shadow economy on the official one and incentive oriented policy means are presented, so that the “black” value added can be transformed into official value added.

JEL class: O17, O5, D78, H2, H26.

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1. Introduction

The intensive discussion about the development of the shadow economy and illicit employment, that has been taking place over the last ten years, has been far from conclusive. On the one hand, it has been argued that illicit employment is partially responsible for such problems as increasing unemployment in the official sector, growing public debt and national pension deficit. On the other hand, it has been claimed that illicit employment is the individual's escape from unjust and burdensome restraints imposed by the government. Thus, the migration into the shadow employment is seen as a reaction to excessive constraints created by public institutions and bureaucracy (Schneider and Badekow (2006)). Furthermore, as argued by sociologists and economists, the shadow economy generates a considerable share of social welfare in many countries.

This study has two major goals: The first is to show the development and the size of the shadow economy of Germany, using different estimation procedures and to elaborate on the driving forces of the shadow economy. The second is to discuss policy measures to reduce the shadow economy. Section 2 contains some theoretical considerations about the shadow economy and section 3 describes the public opinion about the shadow economy, as well as first estimates using the survey method. Section 4 presents an econometric estimation of the shadow economy in OECD countries. Section 5 shows the size and development of the German shadow economy in terms of value added but also the shadow economy labour force is presented. Section 6 contains policy measures for reducing the shadow economy in Germany. Finally, section 7 provides three policy conclusions.

2. Some Theoretical Considerations about the Shadow Economy

2.1. Defining the Shadow Economy

Most authors trying to measure the shadow economy face the difficulty of how to define it.¹ One commonly used working definition is all currently unregistered economic activities that contribute to the officially calculated (or observed) Gross National Product. Smith (1994, 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." Or to put it in another way, one of the

¹ This definition is used for example, by Feige (1989, 1994), Schneider (1994a, 2003, 2005) and Frey and Pommerehne (1984). Do-it-yourself activities are not included. For estimates of the shadow economy and the do-it-yourself activities for Germany see Buehn, Karmann und Schneider (2007) and Karmann (1986, 1990).

broadest definitions of it includes..."those economic activities and the income derived from them that circumvent or otherwise avoid government regulation, taxation or observation"².

In this paper the following more narrow definition of the shadow economy is used³. The shadow economy includes all market-based legal production of goods and services that are deliberately concealed from public authorities for the following reasons:

- (1) to avoid payment of income, value added or other taxes,
- (2) to avoid payment of social security contributions,
- (3) to avoid having to meet certain legal labour market standards, such as minimum wages, maximum working hours, safety standards, etc., and
- (4) to avoid complying with certain administrative procedures, such as completing statistical questionnaires or other administrative forms.

Hence, I will not deal with typical underground, economic (classical crime) activities, which are all illegal actions that fit the characteristics of classical crimes like burglary, robbery, drug dealing, etc. I also exclude the informal household economy which consists of all household services and production. I also do not focus on tax evasion or tax compliance, where already a lot of research has been undertaken⁴.

2.2. Estimating the shadow economy

The definition of the shadow economy plays an important role in assessing its size. By having a clear definition, one can avoid a number of ambiguities and controversies. In general, there are two types of underground economic activity: illicit employment and the production of goods and services consumed within the household.⁵ The following analysis focuses on the former type and excludes illegal activities such as drug production, crime and human trafficking. The latter type includes the production of goods and services, consumed within the household or childcare and is not part of this analysis either. Thus, it only focuses on eco-

² This definition is taken from Del'Anno (2003), Del'Anno and Schneider (2004) and Feige (1989); see also Thomas (1999), Fleming, Roman and Farrell (2000).

³ Compare also the excellent discussion of the definition of the shadow economy in Pedersen (2003, pp.13-19) and Kazemier (2005a) who use a similar one.

⁴ Compare, e.g. the survey of Andreoni, Erard and Feinstein (1998) and the paper by Kirchler, Maciejovsky and Schneider (2002).

⁵ For a broad discussion of the definition issue see, for example, Thomas (1992); Schneider, Volkert and Caspar (2002), Schneider and Enste (2002, 2006) and Kazemier (2005a,b).

conomic activities that would normally be included in national accounts but which due to tax or regulatory burden remain underground. Although such legal activities contribute to the country's value creation, they are not captured in the national accounts because they are produced in illicit ways (e.g. by people without proper qualification or without a master craftman's certificate). From the economic and social perspective, soft forms of illicit employment, such as moonlighting (e.g. construction work in private homes) and its contribution to value creation can be assessed rather positively.

Although the issue of the shadow economy has been investigated for a long time, the discussion regarding the "appropriate" methodology to assess its scope has not come to an end yet.⁶ There are three methods of assessment:

- (1) Direct procedures that are carried out at the micro level and aim at determining the size of the shadow economy at one particular point of time. An example of this method are surveys.
- (2) Indirect procedures that make use of macroeconomic indicators proxying the development of the shadow economy over time.
- (3) Statistical models that use statistical tools to estimate the shadow economy as an "unobserved" variable.

The estimation of the shadow economy of Germany and 20 other highly developed OECD-countries is based on a combination of the currency demand method and the DYMIMIC-procedure and the some for Germany on the survey method⁷. The latter assumes that the shadow economy remains an unobserved phenomenon which can be estimated using quantitatively measurable causes of illicit employment, e.g. tax burden and regulation intensity, and indicators reflecting illicit activities, e.g. currency demand and official work time. A disadvantage of the DYMIMIC procedure is the fact that it produces only relative estimates of the size and the development of the shadow economy. Thus, the currency demand method⁸ is

⁶ For the strengths and weaknesses of the various methods compare Bhattacharyya (1999); Dixon (1999); Feige (1989); Giles (1999a,b,c); Schneider (1986, 2001, 2003, 2005, 2006); Schneider and Enste (2000a; 2000b, 2002, 2006); Tanzi (1999); Thomas (1992; 1999).

⁷ These methods are presented in detail in Schneider (1994, 2005) and Schneider and Enste (2000b, 2002, 2006). Furthermore, these studies discuss advantages and disadvantages of the DYMIMIC- and the money demand methods and other estimation methods for assessing the size of illicit employment.

⁸ This indirect approach is based on the assumption that cash is used to make transactions within the shadow economy. By using this method one econometrically estimates a currency demand function including independent variables like tax burden, regulation etc. which "drive" the shadow economy. This equation is used to make simulations of the amount of money that would be necessary to generate the official GDP. This amount is then compared with the actual money demand and the difference is treated as an indicator for the development of the

used to calibrate the relative estimates into absolute ones by using two or three absolute values of the absolute size of the shadow economy.

2.3. The Main Causes of Determining the Shadow Economy

2.3.1. Tax and Social Security Contribution Burdens

In almost all studies⁹ it has been ascertained that the tax and social security contribution burdens are among the main causes for the existence of the shadow economy. Since taxes affect labour-leisure choices, and also stimulate labour supply in the shadow economy, the distortion of the overall tax burden is a major concern for economists. The bigger the difference between the total cost of labour 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 burden/payments and the overall tax burden, they are key features of the existence and the increase of the shadow economy.

Empirical results of the influence of the tax burden on the shadow economy is provided in the studies of Schneider (1994b, 2000, 2004, 2005) and Johnson, Kaufmann and Zoido-Lobaton (1998a, 1998b); they all found statistically significant evidence for the influence of taxation on the shadow economy. 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.¹⁰ 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 rate) and marginal tax rates have the expected positive effect (on currency demand) and are highly statistically significant. These findings are supported by studies of Kirchgaessner (1982) for Germany and by Klovland (1984) for Norway and Sweden, too.

2.3.2. Intensity of Regulations

shadow economy. Based on this the calculated difference is multiplied by the velocity of money and one gets a value added figure for the shadow economy.

⁹ See Thomas (1992); Lippert and Walker (1997); Schneider (1994a,b, 1997, 1998a,b, 1999, 2000, 2003, 2005); Johnson, Kaufmann, and Zoido-Lobaton (1998a,1998b); Tanzi (1999); Giles (1999a); Mummert and Schneider (2001); Giles and Tedds (2002) and Dell'Anno (2003), just to quote a few recent ones.

¹⁰ See Schneider (1994b, 1998b), who 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.

Increased intensity of regulations is another important factor which reduces the freedom (of choice) for individuals engaged in the official economy. One can think of labour market regulations, trade barriers, and labour restrictions for foreigners. Johnson, Kaufmann, and Zoido-Lobaton (1998b) find significant overall empirical evidence of the influence of (labour) regulations on the shadow economy; and 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. 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. 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 drives 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 estimated sign of the relationship is unambiguous: more regulation is correlated with a larger shadow economy.

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

2.3.3. Public Sector Services

An increase of the shadow economy can lead to reduced state revenues which in turn reduce the quality and quantity of publicly provided goods and services. Ultimately, this can lead to an increase in the tax rates for firms and individuals in the official sector, quite often combined with a deterioration in the quality of the public goods (such as the public infrastructure) and of the administration, with the consequence of even stronger incentives to participate in the shadow economy. Johnson, Kaufmann, and Zoido-Lobaton (1998a/b) present a simple model of this relationship. Their findings show that smaller shadow economies appear in countries with higher tax revenues if achieved by lower tax rates, fewer laws and regulations and less bribery facing enterprises. Countries with a better rule of law, which is financed by

tax revenues, also have smaller shadow economies. Transition countries have higher levels of regulation leading to a significantly higher incidence of bribery, higher effective taxes on official activities and a large discretionary framework of regulations and consequently a higher shadow economy. Their overall conclusion is that "wealthier countries of the OECD, as well as some in Eastern Europe, find themselves in the 'good equilibrium' of relatively low tax and regulatory burden, sizeable revenue mobilization, good rule of law and corruption control, and a [relatively] small unofficial economy. By contrast, a number of countries in Latin American and the former Soviet Union exhibit characteristics consistent with a 'bad equilibrium': tax and regulatory discretion and burden on the firm is high, the rule of law is weak, and there is a high incidence of bribery and a relatively high share of activities in the unofficial economy." (Johnson, Kaufmann and Zoido-Lobaton 1998a p. I).

3. Public Opinion about the Shadow Economy

The perception of citizens/voters about the shadow economy and their (moral) reaction to this phenomenon is also an important factor¹¹, i.e. under which circumstances people decide to work in the shadow economy. There are a number of empirical studies which investigate the tax morale of people and their attitudes towards the shadow economy¹². In this section some results for Germany are shown which clearly demonstrate that people have no bad (moral) feeling when working in the shadow economy. In table 3.1 for the year 2007 it is investigated whether people regularly work in the shadow economy or not. 20.7% of the German respondents say "yes", and 30.8% of the respondents regularly demand shadow economy activities. In table 3.2 some reasons are asked for why shadow economy activities are demanded. The most important result is, one saves money – or shadow economy activities are much cheaper than the official ones. The second most important reason is that tax and social security burden is too high (73% of the respondents) and reason number 3 is that due to the much higher labour costs in the official economy one would not demand these activities. Especially the third answer is interesting, because this result clearly demonstrates that only 22% of the demanded shadow economy activities have substitutive character (i.e. they would be demanded in the official economy if there would be no shadow economy) and 30% of the respondents answer

¹¹ The importance of this variable with respect to theory and empirical relevance is also shown in Feld and Frey (2002, 2002a and 2005), Frey (1997), and Torgler and Schneider (2005, 2006).

¹² Compare Halla and Schneider (2005), Torgler (2002), Torgler and Schneider (2005), Feld and Frey (2005), and Feld and Larsen (2005).

that they would do it themselves. From this survey result one can conclude that roughly 48% of these activities would not take place if there were no shadow economy. In table 3.3 examples of some hourly wage rates of shadow economy activities in Germany are shown and what is surprising here is the huge range of wage rates in the shadow economy, for example the varying "price" for an hour of shadow market work by a painter ranges from € 9 to € 17. Table 3.3 clearly demonstrates also the large difference (a multiplicative factor between 4 and 5) between the wage rates in the shadow economy and in the official one.

In table 3.4 important attitudes held by Germans regarding what may be classified as a "Kavaliersdelikt" (peccadillos) are shown. These results convincingly demonstrate for the years 1996 to 2003 that roughly two thirds of the German population treat shadow economy activities as a "Kavaliersdelikt", whereas only a third treats a small theft such as "stealing a newspaper from a box", as a "Kavaliersdelikt". In table 3.5 value statements of the German population with respect to the shadow economy are shown, and again, two thirds say that without shadow economy earnings one can not keep the achieved standard of living and only a third of the population asked finds that shadow economy activities lead to great losses of tax revenues and social security payments to the state. What are most amazing in table 3.5 are the attitudes of the German population with respect to punishment of shadow economy activities: only between 9% and 3% of the asked German population questioned are convinced that shadow economy workers should be reported to the authorities and prosecuted! One gets a similarly low figure when asking whether a shadow economy worker is detected, he should be severely punished. Only between 7% and 3% of those asked say, "yes". This clearly shows that there is no bad (moral) feeling about working in the shadow economy among the German population. The results are quite similar for Austria.

Table 3.1: Work in the Shadow Economy – Survey Results for 2007

(1) Do you work regularly in the shadow economy?	Values in percent
No	77,3
Yes	20,7
No answer	2
	(25% male, 16% female)
(2) Do you regularly demand shadow economy activities?	Values in percent
No	69,2
Yes	30,8
	(35.4% male, 26.5% female)
Representative questionnaire, Germany, January 2007	
Source: IDW Koeln, Germany	

Table 3.2: Reasons for Shadow Economy Activities – Survey Results for Germany, January 2007

Reasons why shadow economy activities are demanded	Values in percent
(1) One saves money – or they are much cheaper than the official ones	90%
(2) The tax and social security burden is much too high	73%
(3) Due to the high labour costs in the official economy one would not demand these activities (extreme assumption: <i>no shadow economy – 22% demand in the official economy; 30% do-it-themselves; and 48% no demand at all!</i>)	68%
(4) The firms offer them themselves	52%
(5) It's so easy to get quick and reliable workers	31%
Representative questionnaire, Germany, January 2007, Source: IDW Koeln	

Table 3.3: Hourly wage rates of shadow economy activities – Survey Results for Germany, 2004

Activity/Type of Worker	Town/Area	Wage rate in the shadow economy (in €)	Wage rate in the official economy (in €)
Painter	Berlin	10 – 17	42
	München	9 – 15	
	Rhein/Rhur	10 – 12	
Mechanics	Hamburg	13 – 23	58
	Berlin	15 – 19	
	München	15 – 23	
Cost of moving household furniture and other goods (distance 300km)	Berlin	300 – 380	1.800
	München	400 – 450	
	Rhein/Rhur	350 – 420	
Representative questionnaire, May 2003, Source: Schneider (2004)			

Table 3.4: Values/Attitudes of the German population regarding the shadow economy Question: What are "Kavaliersdelikte" (negligible delicts)?

Statement	German Population (in % Yes)				
	May 1996	May 1998	May 2001	Nov./Dec. 2002	Nov./Dec. 2003
To demand activities in the shadow economy	55	64	60	68	67
To drive a car too fast	42	43	44	45	46
To undertake shadow economic activities oneself	36	41	33	36	38
To steal a newspaper from a box	28	29	31	30	28
Not to send children to school	25	27	24	18	16
To be dishonest when completing tax declarations	22	22	18	-	18

Not to go to work (e.g. to skive on a Monday)	18	17	16	13	12
To drive when drunk	9	4	7	3	4
Source: Schneider (2004)					

Table 3.5: Value Judgements/Attitudes from the German population regarding the Shadow Economy

Statement	German Population (in % Yes)				
	May 1996	May 1998	May 2001	Nov./Dec. 2002	Nov./Dec. 2003
Without shadow economy earnings one cannot keep up the standard of living	62	69	69	70	71
It's the state's/government's own fault that the shadow economy is so popular and large, because the tax and social security burden is too high	63	67	57	66	67
In the last 2-3 years I have taken advantage of shadow economic activities	26	38	34	36	39
Due to shadow economic activities the state loses a great amount of tax revenues and social security payments	29	25	30	28	26
In the neighbourhood one can observe a significant number of shadow economic activities	-	-	24	28	32
I think shadow economy workers should be reported to the authorities and prosecuted	9	4	6	3	3
If a shadow economy worker is detected he should be punished severely (high financial fines)	7	4	5	7	3
Source: Schneider (2004)					

Table 3.6: A comparison of the size of the German Shadow Economy using the survey and the DYMIMIC-method, year 2006.

Various kinds of shadow economy activities/values	Shadow Economy in % of official GDP	Shadow Economy in bill. Euro	Fictive jobs (full time equivalent) millions	% share of the overall shadow economy
(1) Shadow economy activities from labour (hours worked)	5.0 – 6.0	117 – 140	2.1 – 2.4	33 – 40
(2) Material (used)	3.0 – 4.0	70 – 90	1.2 – 1.5	20 – 25
(3) Illegal activities (goods and services)	4.0 – 5.0 1.0 – 2.0	90 – 117 23 – 45	1.5 – 2.1 0.4 – 0.8	25 – 33 7 - 13
(4) already in the official GDP included illegal activities				
Sum (1) to (4)	13.0 – 17.0	300 – 392	5.2 – 6.8	85 – 111
Overall (total) shadow economy	15.0	340	6.0	100

(estimated by the DYMIMIC and calibrated by the currency demand procedure)				
Source: Enste/Schneider 2006 and own calculation.				

Finally, in table 3.6, a comparison between the size of the German shadow economy, using the survey and the DYMIMIC method, is undertaken. Also an attempt is made to explain the quite often observed, large differences using a macro (DYMIMIC) and/or currency demand approach to estimate the size of the German shadow economy; e.g. for 2006, we obtain a value of 15% of “official” GDP. Using the survey method, in which the value added of shadow economy from labour activities is captured, one obtains a value between 5 and 6%¹³⁾. Hence, there is quite a huge difference. The first difference originates from the survey method, where usually not the total overall value added is asked, but only the value added of shadow economy work. If one adds material, one might come up with another 3-4% and one has to add other illegal activities (prostitution, gambling and totally illegal working firms in the construction sector). Hence, one has to add another 4-5% of the size of these activities measured in per cent of official GDP. Finally, official national account authorities (also in Germany) add (or include) already some shadow economy activities in the “official” GDP, so one has to include another 1-2% black activities to official GDP, which sums up roughly to 15%. One also realizes that if one measures these different kinds of shadow activities in per cent of overall shadow economy activities that shadow economy activities from labour (hours worked) has the biggest size with 33-40%, followed by illegal activities in the shadow economy with a size of 25-35%. Table 3.6 quite nicely demonstrates how the differences between the size of the shadow economy using the survey method and compared with the macro approach DYMIMIC and/or currency demand can be explained.

4. Econometric Estimation of the Shadow Economy in OECD-Countries

Using the theoretical considerations in section 2 and 3, I develop the following seven hypotheses, which will be empirically tested below:

¹³⁾ Compare also Table 5.1, where the values using the survey method by Feld and Larsen (2005) vary between 3-4% of “official” GDP.

1. An increase in direct and indirect taxation increases the shadow economy, *ceteris paribus*
2. An increase in social security contribution increases the shadow economy, *ceteris paribus*.
3. The more the country is regulated, the greater the incentive is to work in the shadow economy, *ceteris paribus*.
4. The lower the quality of state institutions, the higher the incentive to work in the shadow economy, *ceteris paribus*.
5. The lower the tax morale, the higher the incentive to work in the shadow economy, *ceteris paribus*.
6. The higher the unemployment, the more people engage in shadow economy activities, *ceteris paribus*.
7. The lower the GDP per capita in a country, the higher is the incentive to work in the shadow economy, *ceteris paribus*.

In table 4.1 the econometric estimation using the DYMIMIC approach (latent estimation approach) is presented for 21 OECD-countries. For these countries I have eight data points for 1990/91, 1994/95, 1997/98, 1999/2000, 2001/02, 2002/03, 2003/04 and 2004/05. Besides the usual cause variables like direct and indirect taxation, social security contribution and regulation, I have three additional cause variables, tax morale (an index), quality of state institutions and the burden of social security payments (in % of official GDP). Besides the unemployment quota, annual rate of GDP and change of currency per capita, I use as an additional indicator variable the average working time (per week)¹⁴. The estimated coefficients of all eight cause variables are statistically significant and have the theoretically expected signs. The tax and social security burden variables are quantitatively the most important ones, followed by the tax morale variable which has the single biggest influence. Also the independent variable quality of state institutions is statistically significant and quite important to determine whether one is engaged in shadow economy activities or not. Also the development of the official economy measured in unemployment and GDP per capita has a quantitatively important influence on the shadow economy. Turning to the indicator variables they all have a statistically significant influence and the estimated coefficients have the theoretically expected signs. The quantitatively most important independent variables are the employment quota and change of

¹⁴ Using this indicator variable one has the problem that, of course, this variable is influenced by state regulation, so that this variable is not really exogenous; hence the estimation may be biased.

currency per capita¹⁵. Summarizing, the econometric results demonstrate that in these OECD countries the social security contributions and the share of direct taxation have the biggest influence, followed by tax morale and the quality of state institutions.

¹⁵ The variable currency per capita or annual change of currency per capita is heavily influenced by banking innovations; hence this variable is pretty unstable with respect to the length of the estimation period. Similar problems are already mentioned by Giles (1999a) and Giles and Tedds (2002).

Table 4.1: DYMIMIC Estimation of the Shadow Economy of 21 highly developed OECD Countries, 1990/91, 1994/95, 1997/98, 1999/2000, 2001/02, 2002/03, 2003/04 and 2004/05.

Cause Variables	Estimated Coefficients
Share of direct taxation (in % of GDP)	$\lambda_1 = 0.384^{**}$ (3.06)
Share of indirect taxation (in % of GDP)	$\lambda_2 = 0.196^{(*)}$ (1.84)
Share of social security contribution (in % of GDP)	$\lambda_3 = 0.506^{**}$ (3.86)
Burden of state regulation (index of labour market regulation, Heritage Foundation, score 1 least regular, score 5 most regular)	$\lambda_4 = 0.213^{(*)}$ (1.96)
Quality of state institutions (rule of law, World Bank, score -3 worst and +3 best case)	$\lambda_5 = -0.307^*$ (-2.61)
Tax morale (WUS and EUS, Index, Scale tax cheating always justified =1, never justified =10)	$\lambda_6 = -0.582^{**}$ (-3.66)
Unemployment quota (%)	$\lambda_7 = 0.324^{**}$ (2.61)
GDP per capita (in US-\$)	$\lambda_8 = -0.106^{**}$ (-3.04)
Lagged endogenous variable	$\lambda_9 = -0.165^{(*)}$ (-1.66)
Indicator Variables	Estimated Coefficients
Employment quota (in % of population 18-64)	$\lambda_{10} = -0.626^{**}$ (-2.72)
Average working time (per week)	$\lambda_{11} = -1.00$ (Residuum)
Annual rate of GDP (adjusted for the mean of all 22 OECD countries)	$\lambda_{12} = -0.274^{**}$ (-3.03)
Change of local currency per capita	$\lambda_{13} = 0.312^{**}$ (3.74)
Test-statistics	$RMSE^1 = 0.0016^*$ (p-value = 0.903) $Chi-square^2 = 26.43$ (p-value = 0.906) $TMCV^3 = 0.049$ $AGFI^4 = 0.763$ $N = 168$ $D.F.^5 = 67$

Notes:

t-statistics are given in parentheses (*); *, ** means the t-statistics are statistically significant at the 90%, 95%, or 99% confidence level.

- 1) Steigers Root Mean Square Error of Approximation (RMSEA) for test of close fit; $RMSEA < 0.05$; the RMSEA-value varies between 0.0 and 1.0.
- 2) If the structural equation model is asymptotically correct, then the matrix S (sample covariance matrix) will be equal to $\Sigma(\theta)$ (model implied covariance matrix). This test has a statistical validity with a large sample ($N \geq 100$) and multinomial distributions; both are given for all three equations in tables 3.1.1-3.1.3 using a test of multi normal distributions.
- 3) Test of Multivariate Normality for Continuous Variables (TMNCV); p-values of skewness and kurtosis.
- 4) Test of Adjusted Goodness of Fit Index (AGFI), varying between 0 and 1; 1 = perfect fit.
- 5) The degrees of freedom are determined by $0.5(p + q)(p + q + 1) - t$; with p = number of indicators; q = number of causes; t = the number for free parameters.

In order to calculate the size and development of the shadow economies of Germany and of the remaining 20 OECD countries, I have to overcome the disadvantage of the DYMIMIC approach, which is that one gets only relatively estimated sizes of the shadow economy and one has to use another approach to get absolute figures. Hence, for the calculation of the absolute size of the shadow economies from these DYMIMIC estimation results, I use the already available estimations from the currency demand approach for Austria, Germany, Italy and the United States (from studies of Del'Anno and Schneider (2004), Bajada and Schneider (2003, 2005), and Schneider and Enste (2002)). As I have values of the shadow economy (in % of GDP) for various years for the above mentioned countries, I can use them in a benchmark procedure to transform the index of the shadow economy from the DYMIMIC estimations into cardinal values (This procedure is described in great detail in the paper Del'Anno and Schneider (2003)).

5. The development and size of the shadow economy in Germany and other OECD-countries

5.1. Short Literature Review

Existing estimates of the German shadow economy (measured in percentage of official GDP) are shown in Table 5.1 (see also Feld et.al (2007)). The oldest estimate uses the survey method of the Institute for Demoscopy (IfD) in Allensbach, Germany and shows that the shadow economy was 3.6% of official GDP in 1974. In a much later study, Feld and Larsen (2005) undertook an extensive research project using the survey method to estimate shadow

economic activities in the years 2001 and 2004.¹⁶ Using the officially paid wage rate, they concluded that these activities reached 4.1% in 2001 and 3.1% in 2004. Using the (much lower) shadow economy wage rate, however, these estimates shrink to 1.3% and 1.0%, respectively. If we look at the discrepancy method, for which we have estimates from 1970 to 1980, the German shadow economy is much larger: using the discrepancy between expenditure and income, we get approximately 11% for the 1970s, and using the discrepancy between official and actual employment, roughly 30%. The physical input methods where estimates for the 1980s are available deliver values of around 15% for the second half of that decade. The (monetary) transaction approach developed by Feige (1996) places the shadow economy at 30% between 1980 and 1985. Yet another monetary approach, the currency demand approach – the first person to undertake an estimation for Germany was Kirchgässner (1983, 1984) – provides values of 3.1% (1970) and 10.1% (1980). Kirchgässner's values are quite similar to the ones obtained by Schneider and Enste (2000, 2002), who also used a currency demand approach to value the size of the shadow economy at 4.5% in 1970 and 14.7% in 2000. Finally, if we look at latent (DY)MIMIC estimation procedures, the first ones being conducted by Frey and Weck-Hannemann (1984), and later, Schneider and others followed for Germany, again, the estimations for the 1970s are quite similar. Furthermore, Schneider's estimates using a DYMIMIC approach (Schneider (2005, 2007)) are close to those of the currency demand approach.

Thus, we can see that different estimation procedures produce different results. It is safe to say that the figures produced by the transaction and the discrepancy approaches are rather unrealistically large: the size of the shadow economy at almost one-third of official GDP in the mid-1980s is most likely an overestimate. The figures obtained using the currency demand and hidden variable (latent) approaches, on the other hand, are relatively close together and much lower than those produced by other methods (i.e. the discrepancy or transaction approaches). This similarity is not surprising given the fact that the estimates of the shadow economy using the latent (MIMIC) approach were measured by taking point estimates from the currency demand approach.

¹⁶ In our paper there is no extensive discussion about the various methods to estimate the size and development of the shadow economy, also we do not discuss the strength and weaknesses of each method. Compare for this Schneider and Enste (2000), Schneider (2005), Feld and Larsen (2005), Pedersen (2003), and Giles (1999a,b,c).

Table 5.1 *The Size of the Shadow Economy in Germany According to Different Methods (in Percentage of Official GDP)*

Method	Shadow economy (in percentage of official GDP) in:								Source
	1970	1975	1980	1985	1990	1995	2000	2005	
Survey	-	3.6 ¹⁾	-	-	-	-	-	-	IfD Allensbach (1975)
	-	-	-	-	-	-	4.1 ²⁾	3.1 ²⁾	Feld and Larsen (2005)
	-	-	-	-	-	-	1.3 ³⁾	1.0 ³⁾	
Discrepancy between expenditure and income	11.0	10.2	13.4	-	-	-	-	-	Lippert and Walker (1997)
Discrepancy between official and actual employment	23.0	38.5	34.0	-	-	-	-	-	Langfeldt (1983, 1984)
Physical input method	-	-	-	14.5	14.6	-	-	-	Feld and Larsen (2005)
Transactions approach	17.2	22.3	29.3	31.4	-	-	-	-	
Currency demand approach	3.1	6.0	10.3	-	-	-	-	-	Kirchgässner (1983)
	12.1	11.8	12.6	-	-	-	-	-	Langfeldt (1983, 1984)
	4.5	7.8	9.2	11.3	11.8	12.5	14.7	-	Schneider and Enste (2000)
Latent ((DY)MIMIC) approach	5.8	6.1	8.2	-	-	-	-	-	Frey and Weck (1984)
	-	-	9.4	10.1	11.4	15.1	16.3	-	Pickardt and Sarda (2006)
	4.2	5.8	10.8	11.2	12.2	13.9	16.0	15.4	Schneider (2005, 2007)
Soft modelling	-	8.3 ⁴⁾	-	-	-	-	-	-	Weck-Hannemann (1983)

1) 1974.

2) 2001 and 2004; calculated using wages in the official economy.

3) 2001 and 2004; calculated using actual “black” hourly wages paid.

5.2 Latest Policy Measures and their Effect on the German Shadow Economy

Table 5.2 illustrates the development of the shadow economy in Germany between 1975 and 2007. This development indicates that after a continuous growth of the shadow economy (measured as a share of the official sector), its size has been decreasing since 2004. Whereas in 2003 the shadow economy in Germany was estimated at 370.0 billion Euros, in 2004 it was only 356.1 billion Euros and decreased to 346.2 billion Euro in 2005. Also in 2006 the volume of the shadow economy in Germany decreased further by 0.7 billion Euro. However, in 2007 the shadow economy will increase again because of the rise of the value added tax rate from 16 to 19%.

The introduction of the expanded “Mini-Job” regulation, which came into force on 1st of April 2003, was an important reason for the decline of the shadow economy since 2004. This legislation led to a reduction of illicit employment in 2004 and 2005 by 9 billion Euros. A further increase in the number of “Mini-Jobs” in 2007 is, however, not expected.

It is quite difficult to estimate to what extent the rather new measures for better coordination and more efficient actions against the shadow economy with the stricter legislation on combating the shadow economy introduced in August 2004 contribute to a successful reduction of illicit employment. According to the performed simulations, the new legislation reduced the shadow economy by 1.0 bn Euro in 2005. Overall, however, it remains ambiguous whether stricter legislation is an effective tool to reduce illicit employment. There are two reasons for that. First, the control effort necessary to eliminate such activities is very high. Second, in many cases citizens are not aware of law infringement. This is particularly true in the case of “black” household goods and services production.

Table 5.2: The shadow economy in Germany, Austria and Switzerland from 1975 to 2007 – estimated by currency demand and DYMIMIC-procedures¹⁾

Year	The size of the shadow economy (in % of “official” GDP)	
	Germany in %	bn €
1975	5.75	29.6
1980	10.80	80.2
1985	11.20	102.3
1990	12.20	147.9
1995	13.90	241.1 ²⁾
1996	14.50	257.6 ²⁾
1997	15.00	274.7 ²⁾
1998	14.80	280.7 ²⁾
1999	15.51	301.8 ²⁾
2000	16.03	322.3 ²⁾
2001	16.02	329.8 ²⁾
2002	16.59	350.4 ²⁾
2003	17.10	370.0 ²⁾
2004	16.12	356.1 ²⁾
2005	15.41	346.2 ²⁾
2006 ³⁾	14.86	345.5 ²⁾
2007 ³⁾	14.64	349.0 ²⁾

1) Source: Own calculations.

2) From 1995 on values for East and West Germany are given.

3) Projections.

A number of the policy measures introduced by the German government in the last two years influence the shadow economy in 2006 and 2007. However, as some of them counterbalance others, no drastic changes in the development of the shadow economy can be expected. The simulations gave the following results (see table 5.3):

- (1) The abolition of subsidies for private house builders that came into force as of 1 January 2006 lead to a growth of the shadow economy in 2006 by 0.2 -0.35 bn Euro, because some households will attempt to replace state subsidies through seeking for other “income sources”. However, as this provision applies only to new claims, and not to subsidies already granted, the abolition of the subsidies for private house builders will have a more pronounced effect in the future. The more so, as many households applied for subsidies in 2005. Thus, the positive impact of this action on the shadow economy will amount to 0.2 – 0.35 billion Euros in 2006 and between 0.5 and 0.8 billion Euros in 2007.
- (2) The new measure on the tax deductibility of building maintenance and modernization as well as of child and home care cost as of 1 January 2006 was intensively taken advantage of and in 2006 (2007) it reduced the size of the shadow economy by 0.75 bn – 1.25 (2.50 – 3.80) bn Euro, ceteris paribus.
- (3) The since 1.7.2006 increased social insurance rate (from 25 to 30%) of the commercial minijobs will lead to an increase of the shadow economy. First and preliminary calculations predict an increase in the volume of the shadow economy by between 400 and 700 Million Euro.

Overall, the above listed measures lead to a decrease in the size of the shadow economy by 150 to 250 Million Euro. There are a number of other measures recently (beginning 2006) taken that are likely to affect the decision to migrate into the shadow economy. Examples include the combination of “Ich-AG” with the bridge-payment scheme, an increase of the threshold (from 350000 € to 500000 €) for the bookkeeping obligation for start-ups or the increase of the actual turnover taxation threshold (from 125000 € to 250000 €) as of the 1 January 2006. Their impact can be estimated the earliest in 2007. One of the positive effects of the above measures will be a better coordination of anti-illicit employment activities between the government and the regional and local administration.

Table 5.3: Impact of the economic measures of the Grand Coalition on the shadow economy in 2006 and 2007

Measure	Increase (+)/decrease (-) of the shadow economy
1) Increase of the <u>VAT</u> from 16 to 19% (since 1.1.2007)	2007: + 3000 to + 5000 million €
2) <u>Increase of insurance fees for commercial “Mini-Jobs” from 25 to 30 % (since 1.7.2006)</u>	2006: +400 to +700 million € 2007: + 2500 to + 3500 million €
3) “<u>Rich tax</u> “ at 45% on private income above €250000/€500000 p.a. (since 1.1.2007)	2007: + 600 to + 900 million €
4) <u>Abolition of the subsidies for private house builders (since 1.1.2006)</u>	2006: + 200 to + 350 million € 2007: + 500 to + 800 million €
5) <u>Health insurance fees increase by 0.5% since 1.1.2007</u>	2007: + 600 to + 900 million €
6) <u>Decrease in non-wage labour cost (unemployment insurance from 6.5 to 4.2%) since 1.1. 2007</u>	2007: - 1200 to – 2700 million €
7) <u>Tax deductibility of building maintenance and modernization as well as of child and home care cost, retroactive since 1.1.2006</u>	2006: - 750 to -1250 million € 2007: - 2500 to – 3800 million €
Net Effect for 2006	- 150 to - 250 million €
Net Effect for 2007	+ 3300 to + 4800 million €

Source: Own calculations.

Apart from the above discussed measures such as the abolition of subsidies for private house builders and the new regulations on the tax deductibility of maintenance cost and child and home care, which are expected to reduce the size of the shadow economy by 2 to 3 bn Euro in 2007, there are other measures that will reinforce the economic activity in the underground sector. These include an increase of the value-added tax rate, an increase in the tax rate for individuals with high income, and an increase of the health insurance contributions by 0.5% as well as the decrease of the unemployment insurance contribution. The impact of these actions on the development of the shadow economy in 2007 is estimated as follows (see table 5.3):

- (1) Due to the increase of the value-added tax in 2007, the shadow economy is estimated to grow by between 3.0 and 5.0 bn Euro.

- (2) The planned increase of the private income tax on individuals/families with income above 250000/500000 Euro p.a. to 45% will cause the shadow economy to grow by 0.6 to 0.9 bn Euro.
- (3) Due to the increase of social insurance contributions levied on “Mini-Jobs” in the commercial sector from 25% to 30% coming since 1.7.2006, illicit employment will increase by 2500 to 3500 million Euro.
- (4) Due to the increase of health insurance contributions by 0.5% as of 1 January 2007, the shadow economy will grow by 600 to 900 million Euro.
- (5) At the same time, the reduction of the unemployment insurance fees from 6.5 % to 4.2 % coming into force as of 1 January 2007, will reduce the size of the shadow economy by 1.2 to 2.7 bn Euro, where the increase of the increase social insurance contributions was already taken into account.

Whereas the decisions taken by the government in 2006 lead to a slight decrease of the shadow economy, it is expected that the shadow economy will grow in 2007 by between 3300 and 4800 bn Euro. In other words, the downward trend in the development of the shadow economy is likely to end.

5.3. Size and Development of the Shadow Economy in 21 OECD-Countries

In order to allow for an international comparison of the shadow economy with other OECD countries, Table 5.4, present the findings for 21 OECD countries until 2007. They clearly reveal that since the end of 90's the size of the shadow economy in most OECD countries continued to decrease. The unweighted average for all countries in 1999/2000 was 16.8% and dropped to 13.9% in 2007. Since 1997/98 - the year in which the shadow economy was the biggest in most OECD countries, it has continuously shrank. Only in Germany, Austria and Switzerland the growing trend lasted longer and was reversed only two or three years ago. The reduction of the share of the shadow economy in the GDP between 1997/98 and 2007 is most pronounced in Italy (-5.0%) and in Sweden (-4.0).

The German shadow economy lays in the middle of the ranking, whereas Austria and Switzerland are located in the lower bound. With 20% to 26%, South European countries exhibit the biggest shadow economies measured as a share of the official GDP. They are followed by Scandinavian countries whose shadow economies' shares in GDP range between 15 and 16%.

One reason for the differences in the size of the shadow economy between these OECD countries includes, among others, that there are fewer regulations in the US compared to Germany, where everything what is not explicitly allowed is forbidden. The individual's freedom is limited in many areas by far-reaching state interventions. As a result, their necessity and eligibility are not recognised. Provocatively speaking: Italy's shadow economy is so large because much of what is forbidden is seen as legitimate.

**Table 5.4: The size of the shadow economy in 21 OECD countries between 1989/90 and 2007
Estimated using the money demand and DYMIMIC methods (in % of official GDP)**

OECD-countries	Average 1989/90	Average 1994/95	Average 1997/98	Average 1999/00	Average 2001/02	2003	2004	2005 ¹	2006 ¹	2007 ¹
1. Australia	10.1	13.5	14.0	14.3	14.1	13.7	13.2	12.6	11.4	10.7
2. Belgium	19.3	21.5	22.5	22.2	22.0	21.4	20.7	20.1	19.2	18.3
3. Canada	12.8	14.8	16.2	16.0	15.8	15.3	15.1	14.3	13.2	12.6
4. Denmark	10.8	17.8	18.3	18.0	17.9	17.4	17.1	16.5	15.4	14.8
5. Germany	11.8	13.5	14.9	16.0	16.3	17.1	16.1	15.4	14.9	14.6
6. Finland	13.4	18.2	18.9	18.1	18.0	17.6	17.2	16.6	15.3	14.5
7. France	9.0	14.5	14.9	15.2	15.0	14.7	14.3	13.8	12.4	11.8
8. Greece	22.6	28.6	29.0	28.7	28.5	28.2	28.1	27.6	26.2	25.1
9. Great Britain	9.6	12.5	13.0	12.7	12.5	12.2	12.3	12.0	11.1	10.6
10. Ireland	11.0	15.4	16.2	15.9	15.7	15.4	15.2	14.8	13.4	12.7
11. Italy	22.8	26.0	27.3	27.1	27.0	26.1	25.2	24.4	23.2	22.3
12. Japan	8.8	10.6	11.1	11.2	11.1	11.0	10.7	10.3	9.4	9.0
13. Netherlands	11.9	13.7	13.5	13.1	13.0	12.7	12.5	12.0	10.9	10.1
14. New Zealand	9.2	11.3	11.9	12.8	12.6	12.3	12.2	11.7	10.4	9.8
15. Norway	14.8	18.2	19.6	19.1	19.0	18.6	18.2	17.6	16.1	15.4
16. Austria	6.9	8.6	9.0	9.8	10.6	10.8	11.0	10.3	9.7	9.4
17. Portugal	15.9	22.1	23.1	22.7	22.5	22.2	21.7	21.2	20.1	19.2
18. Sweden	15.8	19.5	19.9	19.2	19.1	18.6	18.1	17.5	16.2	15.6
19. Switzerland	6.7	7.8	8.1	8.6	9.4	9.5	9.4	9.0	8.5	8.2
20. Spain	16.1	22.4	23.1	22.7	22.5	22.2	21.9	21.3	20.2	19.3
21. USA	6.7	8.8	8.9	8.7	8.7	8.5	8.4	8.2	7.5	7.2
Unweighted average for 21 OECD countries	12.7	16.2	16.8	16.8	16.7	16.5	16.1	15.6	14.5	13.9

➔ Source: Own calculations, 2007, (Prof. Dr. Friedrich Schneider, University of Linz, Altenbergerstraße 69, A-4040 Linz/Auhof). Preliminary results.

6. Policy measures for reducing the shadow economy in Germany: Some General Remarks

The rigidity of the European and particularly German labour market and the tax and social system contributions burden are certainly two important causes of the relatively large shadow economy in most European OECD countries, compared to the US. Thus, in order to reduce the scope and size of the illicit employment and the shadow economy, one has to tackle these issues with appropriate reforms. If the necessary measures are not taken, the incentive to move from the underground economy to the official sector will decrease. Furthermore, stricter criminal law will not solve the problem, because German citizens do not perceive illicit employment as law infringement and, as a result, 2/3 of them would not report illicit economic activities to the authorities (see Kirchgässner (2003, 2006)).

From an economic and social policy perspective, the question of what the state authorities could do in order to reduce the size of the shadow economy is repeatedly raised; in other words, whether it is possible to transfer the millions of working hours and/or the ten-thousands of jobs from the shadow into the official economy. It is doubtful that this can be achieved only through legislation measures, i.e. more severe penalties,¹⁷⁾ because 2/3 of the value added in the German shadow economies is created by self-employed and employees. In other words, illicit employment is a common phenomenon across the entire country. Furthermore, German citizens do not perceive illicit employment as law infringement. Only 2/3 of the society in both countries sees it as a minor violation of law.

In order to curb illicit employment down policy makers should concentrate on its causes. Some steps in the right direction have already been made in recent years. However, attempts to reduce non-wage labour cost were only moderately successful. These measures belong to the most important and efficient ones. At the same time, their enforcement demands social consensus, which requires also that other taxes, e.g. energy tax, will be increased. The increase of the value-added tax rate which is in force since January 1, 2007 is contraproductive to the measures aiming at a reduction of the shadow economy. Thus, it is worth considering reimbursing VAT on labour intensive services (the so-called Luxembourg model) in order to strengthen the supply of those services by the official economy. Some European neighbour countries have retained an option to levy a reduced VAT rate on labour intensive services for a limited period of time. Such measures lead obviously to a decrease in tax revenues, but if

¹⁷⁾ See Feld and Larsen (2005, 2007) and Feld and Frey (2002, 2007).

they succeed in transferring some part of services produced into the official economy (25-33%), the tax losses will be partially compensated. This recommendation could be introduced in such sectors as old building reconstruction, the catering and tourism, i.e. sectors that are particularly harmed by high labour cost.

It is obvious that the shadow economy represents a challenge for both economic and national policy. As already mentioned, in order to succeed in transferring illicit employment into the official sector, it is necessary to concentrate on the causes. The most important ones include the growing burden of taxation and contributions related to labour in the official sector. Stricter penalties address only the results of the shadow economy are expensive and do not necessarily eliminate the core problem (e.g. high taxation and regulation). In the middle and long run, the size of the shadow economy can be efficiently reduced only through such measures as lowering the non-wage labour costs, introducing flat-rate tax and social security contributions for side jobs and the increase of the tax-free amount. Other measures include the reduction of regulatory burden and the decrease of the value-added tax rate on labour intensive services.

It is much easier to move from the official sector into the shadow economy than to come back from it. In particular, because it is rather difficult to immediately find income alternatives in the “official” economy. Thus, the above measures will not have an instant effect. Applying them, however, guarantees a success in stabilizing or even restraining the shadow economy in the long run. The main problem is, therefore, not the lack of measures but rather the lack of the will on the side of the policy makers to take necessary steps despite likely resistance.

To conclude, it is necessary to answer the question of whether the decreasing size of the shadow economy is a blessing or a curse for Germany or other OECD-countries. Assuming that 2/3 of all activities in the shadow economy complement those in the official sector, i.e. those goods and services would not be produced in the official economy without input from the shadow economy, the development of the shadow economy can lead to more value added “creation”. Similarly, the decline of the shadow economy production will increase the social welfare only if a larger part of it is transferred into the official economy. If it is not the case, both the official and the unofficial production the overall (total) value added will decrease. It is therefore necessary to introduce such economic and fiscal measures that increase the incentive to move the production from the unofficial sector into the official economy. Only then will the decline of the shadow economy be a blessing for the entire economy.

Furthermore, it should be considered that declining social security and health insurance contributions, a result of the growing shadow economy, are most harmful for public institutions. Thus, it should be a part of the fiscal and economic policy agenda to create more jobs in the official sector, which will increase social security and health insurance contributions. Only in this case will the decline of the shadow economy be a blessing for public institutions as well.

7. Conclusions

Finally, I want to draw three conclusions of this paper:

The **first conclusion** is that shadow economies are a complex phenomenon present to an important extent in all type of economies (developing, transition and highly developed). People engage in shadow economic activity for a variety of reasons, among the most important of which we can count are government actions, most notably, taxation and regulation. With this insight/conclusion goes a **second**, no less important one: a government aiming to decrease shadow economic activity has to first and foremost analyze the complex relationships between the official and shadow economy – and even more important – among consequences of its own policy decisions.

Considering a public choice perspective a final and **third conclusion** for highly developed countries is that a government may not have a great interest to reduce the shadow economy due to the facts that:

- (i) tax losses may be moderate, as at least 2/3 of the the income earned in the shadow economy is immediately spent in the official economy,
- (ii) income earned in the shadow economy increases the standard of living of at least 1/3 of the working population, and
- (iii) between 40 and 50% of the shadow economy activities have a complementary character, which means that additional value added is created, and this increases the official GDP.
- (iv) people who work in the shadow economy have less time for other things like going to demonstrations, etc.

Considering these three conclusions, it is obvious that one of the big challenges for every government is to undertake efficient incentive orientated policy measures in order to make work less attractive in the shadow economy and hence to make the work in the official economy more attractive. In a number of OECD countries this policy direction has been successfully implemented and this has led to a reduction of the shadow economy.

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