

Chapter 5

What Is the Extent of the Shadow Economy in Serbia?

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5.1 Introduction

The last country study on the shadow economy in FR Yugoslavia/Serbia with policy recommendations dates from 1998 (Krstić et al. 1998). The size of the shadow economy is estimated at 34.5 % of registered GDP, using data from the special individual survey on the informal economy and applying the modified labour market supply approach suggested by Contini (1981, 1992).

Two multi-country studies that include estimates of the shadow economy for transition economies including Serbia are Schneider (2004) and Christie and Holzner (2004). Schneider's paper provides estimates of the shadow economy for countries from around the world using the MIMIC econometric approach. The size of the shadow economy in Serbia and Montenegro (still one country at that time) was estimated at 39.1 % of measured GDP in 2002/2003 and 41.4 % in 2006/2007 (Schneider 2007). Christie and Holzner (2004) analyze a range of South Eastern Europe (SEE), Central Eastern Europe, and Baltic (CEB) countries. They take a different approach from that of Schneider (2004) and focus instead on household tax compliance (HTC). They found a wider range of estimates compared to Schneider's results, with Serbia, perhaps surprisingly, estimated at just 19 % of GDP in 2001.

In this chapter, we will present estimates of the extent of the shadow economy based on three methods: (1) the MIMIC method, (2) the household tax compliance (HTC) method, and (3) the Survey on Conditions for Doing Business in Serbia. Estimates of the shadow economy for the period 2001–2010 using the MIMIC

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method were made for Serbia and ten other Central and Eastern European countries: Bulgaria, the Czech Republic, Estonia, Lithuania, Latvia, Hungary, Poland, Romania, Slovenia, and Slovakia.

The estimate of the shadow economy using the HTC method was based on macroeconomic data on household consumption and income for 2010. The third estimate was made using the findings of the Survey on Conditions for Doing Business in Serbia. When comparing these assessments it is necessary to bear in mind that their coverage of the shadow economy differs, both in terms of institutional sectors (businesses, households, etc.) and informal activities (trade in goods, undeclared work, unreported property, fees, charges, etc.). The MIMIC method has the greatest coverage, since it comprises all institutional sectors and all forms of the shadow economy. The HTC method covers informal activities that can be identified in household income and consumption, but not those that are exclusively in the businesses. The Survey on Conditions for Doing Business in Serbia was the basis for estimating the extent of the shadow economy in the sector of businesses and entrepreneurs for the two main types of informal activity, illicit trade in goods and undeclared work. It is necessary to bear in mind that estimates of the shadow economy in the households sector (the HTC method) and the business and entrepreneur sector (the Survey) cannot be viewed as cumulative since they for the most part cover the same forms of informal activity (undeclared work, trade in goods), albeit with some minor differences in their coverage.

In addition to estimating the shadow economy, this chapter also provides estimates of the VAT gap, the personal income tax gap, and the social security contributions gap. Differences in coverage must be taken into account when interpreting and comparing these assessments, as must be the fact that all estimates of the shadow economy are only approximate.

Methodological differences between the methods and sources of data must also be considered, since they can affect the findings to some degree. Whilst the first method of estimating the shadow economy is based on modelling, the second is indirect in its approach, since the estimates are based on macroeconomic data obtained from national accounts. The third method is direct and is based on microeconomic data from the Survey on Conditions for Doing Business in Serbia.

5.2 Estimate of the Shadow Economy Using the MIMIC Method

5.2.1 Introduction

The size and development of the Central and Eastern European shadow economies have been measured since the late 1980s, starting with the work of Kaufmann and Kaliberda (1996), Johnson et al. (1997), and Lackó (1996). All these authors use the physical input (electricity) method and come up with quite large figures (from a

macro perspective). In the work of Belev (2003) the above mentioned studies are critically evaluated, arguing that the estimated size of the shadow economies are to a large extent a historical phenomenon (due to the communist eras of all of these countries) and partly determined by institutional factors.¹

Definition of the Shadow Economy

The shadow economy is defined as the ensemble of all market-based legal production activities that are deliberately concealed from public authorities for one or more reasons: to evade payment of income, value added, or other taxes; to evade payment of social security contributions; to evade certain legal labour market standards, such as minimum wages, maximum working hours, safety standards, etc.; and to evade certain administrative procedures, such as completing statistical questionnaires or administrative forms (Schneider et al. 2010). On average, the informal economy refers to legitimate goods rather than illegal goods. The macro estimates include smuggling of legitimate goods within the definition. Thus, smuggled goods/inputs that make their way into legitimate production are implicitly included in the definition of shadow economy.

In this section, we present the estimation procedure of the MIMIC method, and estimation results and their interpretation for the following countries over the period 2001–2010: Serbia, Bulgaria, the Czech Republic, Estonia, Latvia, Lithuania, Hungary, Poland, Romania, Slovenia, and Slovakia.

Based on the MIMIC method, we estimated that the extent of the shadow economy in Serbia declined from 33.2 % of GDP in 2001 to 30.1 % of GDP in 2010. When compared to other countries the shadow economy in Serbia was greater than the averages for the selected 11 countries throughout the period observed. Only Bulgaria recorded a more extensive shadow economy, in percentage of GDP, than Serbia (by 2.2 percentage points in 2010).

5.2.2 The MIMIC Model Approach

Most methods for estimating the size of the shadow economy so far consider just one indicator that captures all effects of the shadow economy. However, effects of the shadow economy show up simultaneously in the production, labour, and money markets. An even more important critique is that several causes that determine the size of the shadow economy are only taken into account in some of the monetary approach studies that usually consider one cause, the burden of taxation. The model

¹For a critical evaluation of the various estimations and calibration methods see Schneider (2005), Feld and Schneider (2010), and Schneider (2010, 2011).

approach explicitly considers multiple causes of the existence and growth of the shadow economy, as well as the multiple effects of the shadow economy over time in several indicator variables. The empirical method is based on the statistical theory of unobserved variables, which considers multiple causes and multiple indicators of the phenomenon to be measured. For the estimation, a factor-analytic approach is used to measure the hidden economy as an unobserved variable over time. The unknown coefficients are estimated in a set of structural equations within which the ‘unobserved’ variable cannot be measured directly. The MIMIC (multiple-indicators multiple-causes) model consists in general of two parts, with the measurement model linking the unobserved variables to observed indicators.² The structural equations model specifies causal relationships between the unobserved variables. In this case there is one unobserved variable, the size of the shadow economy: this is assumed to be influenced by a set of indicators for the shadow economy’s size, thus capturing the structural dependence of the shadow economy on variables that may be useful in predicting its movement and size in the future. The interaction over time between the causes Z_{it} ($i = 1, 2, \dots, k$), the size of the shadow economy X_t , in time t , and the indicators Y_{jt} ($j = 1, 2, \dots, p$) is shown in Fig. 5.1.

There is a large body of literature³ on the possible causes and indicators of the shadow economy, which distinguishes four types of cause:

- (1) The burden of direct and indirect taxation, both actual and perceived—an increasing tax burden is a strong incentive to work in the shadow economy.
- (2) The burden of regulation as a proxy for all other state activities. It is assumed that increases in the burden of regulation are a strong incentive to enter the shadow economy.
- (3) Tax morality (citizens’ attitudes toward the state), which describes the readiness of individuals to leave their official occupations, at least partly, and enter the shadow economy: it is assumed that a declining tax morality increases the size of the shadow economy.⁴
- (4) Institutional factors such as good governance or corruption and rule of law are also important.⁵

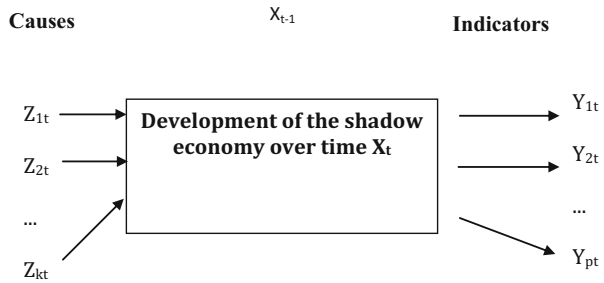
² Papers dealing extensively with the MIMIC approach, its development, and especially its weaknesses are by Dell’Anno (2003) as well as the studies by Giles and Tedds (2002), Breusch (2005a, b), Dell’Anno and Schneider (2009) and Schneider (2011).

³ Thomas (1992), Schneider (1994, 1997, 2003, 2005, 2010, 2011), Pozo (1996), Johnson et al. (1998a, b), Giles (1997a, b, 1999a, b), Giles and Tedds (2002), Giles et al. (2002), Dell’Anno (2003), Dell’Anno and Schneider (2004), and Feld and Schneider (2010).

⁴ When applying this approach to European countries, Frey and Weck-Hannemann (1984) had difficulty in obtaining reliable data for the cause series, as well as for the direct and indirect tax burdens. Hence, their study was criticized by Helberger and Knepel (1988), who argued that the results were unstable with respect to changing variables in the model and over the years.

⁵ Compare here the survey of Feld and Schneider (2010).

Fig. 5.1 Development of the shadow economy over time



A change in the size of the shadow economy is reflected in the following indicators:

- (1) Development of monetary indicators. If activities in the shadow economy rise, additional monetary transactions are required.
- (2) Development of the labour market. Increased participation of workers in the hidden sector results in a decrease in participation in the official economy. Similarly, increased activities in the hidden sector may be reflected in shorter working hours in the official economy.
- (3) Development of the production market. An increase in the shadow economy means that inputs (especially labour) move out of the official economy (at least partly), and this displacement might have a depressing effect on the official growth rate of the economy.

The approach has been used e.g., by Giles (1999a, b) and by Giles et al. (2002), Giles and Tedds (2002) and Bajada and Schneider (2005), who obtain a time series index of the hidden/measured output of New Zealand, Canada, India, and Australia, and then estimate a separate ‘cash-demand model’ to obtain a benchmark for converting this index into percentage units. Unlike earlier empirical studies of the hidden economy, proper attention is directed at the non-stationary and possible co-integration of time series data. Again, this MIMIC model treats hidden output as a latent variable, and uses several (measurable) causal variables and indicator variables. The former include measures of the average and marginal tax rates, inflation, real income, and the degree of regulation in the economy. The latter include changes in the (male) labour force participation rate and in the cash/money supply ratio. In their cash-demand equation they allow for different velocities of currency circulation in the hidden and recorded economies. Their cash-demand equation is not used as an input to determine the variation in the hidden economy over time, but only to obtain the long-run average value of hidden/measured output, so that the index for this ratio predicted by the MIMIC model can be used to calculate the level and the percentage units of the shadow economy. Overall, this latest combination of the currency demand and MIMIC approach clearly shows that some progress in the estimation technique of the shadow economy has been achieved and a number of critical points have been overcome.

However, there are also objections to this method, as follows:

- (1) instability in the estimated coefficients with respect to sample size changes,
- (2) instability in the estimated coefficients with respect to alternative specifications,
- (3) difficulty in obtaining reliable data on cause variables other than tax variables,
- (4) the reliability of grouping the variables into “causes” and “indicators” in explaining the variability of the shadow economy, and
- (5) the calibration method used to transform the relative estimates into absolute ones.

In spite of these objections, and knowing that all other methods also have severe weaknesses, the MIMIC procedure is used to estimate the shadow economies of 11 Eastern and Central European countries.

5.2.3 Econometric Results and Their Interpretation

In Table 5.1 the econometric estimation results using the MIMIC approach (latent estimation approach) is presented for the 11 Central and Eastern European countries over the period 2001–2010 (e.g. ten data points). As causal variables we can chose from the following:

- i. Indirect taxation revenues in percent of GDP,
- ii. Direct taxation revenues in percent of GDP,
- iii. Marginal income tax burden in percent,
- iv. Effective average tax rate in percent,
- v. Regulatory quality index (World Bank indicator), which ranges from -2.5 (weak) to $+2.5$ (strong) governance performance,
- vi. Rule of law (World Bank indicator), which ranges from -2.5 (weak) to $+2.5$ (strong) governance performance,
- vii. Corruption Index, World Bank ($=0$ bad freedom from corruption and $=100$ most freedom from corruption),
- viii. Self-employment in percent of total employment and
- ix. Unemployment rate in percent.

As indicator variables we use:

- i. Cash per capita growth,
- ii. Employment rate in percent and
- iii. GDP per capita.

If we interpret the econometric results shown in Table 5.1⁶ we realize that indirect taxation has the expected positive sign and is highly statistically significant.

⁶ We present three plausible and ‘best’ results: the stability of the econometric results is somewhat weak due to the dataset.

Table 5.1 MIMIC estimation of the shadow economies of 11 Central and Eastern Europe Countries, 2001–2010

Cause variables	Model 1	Model 2	Model 3
Indirect tax in % of GDP	0.54** (7.01)	0.51** (7.40)	0.15* (2.03)
Direct taxes in % of GDP	–	–	–
Marginal income tax burden in %	–	0.27** (3.25)	0.26** (2.93)
Effective average tax rate in %	0.21** (2.13)	–	–
Business freedom (Index = 0 least, =100 most freedom)	0.03 (0.41)	0.07 (0.86)	–0.05 (–0.71)
Corruption (=0 least freedom from, =100 most freedom from corruption)	–0.68** (–6.13)	–0.63** (–6.59)	–
Self-employment in % of total employment	0.12 (1.61)	0.03 (0.49)	0.21** (2.61)
Unemployment rate in %	0.41** (5.72)	0.42** (6.37)	0.53** (7.12)
Rule of law (–2.5 weakest rule of law, 2.5 strongest rule of law)	–	–	–0.93** (–7.75)
<i>Indicator variables</i>			
Cash/M1 per capita growth	0.15 (1.41)	0.16 (1.49)	0.17 (1.48)
Employment rate in %	1.00	1.00	1.00
GDP per capita	–0.64** (–6.01)	–0.60** (–5.58)	–0.70** (–6.55)
RMSEA	0.29	0.22	0.19
Chi-squared	35.23	37.45	47.47
AGFI	0.82	0.81	0.91
N	64	64	64
D.F.	27	27	27

Source: Own calculations

Also, the variables measuring the direct income tax burden have the expected sign and are statistically significant. The business freedom index of the World Bank is not statistically significant, as opposed to the cause variable “rule of law”. Self-employment has the expected positive sign but is not statistically significant; the unemployment rate again has the expected positive sign and is highly statistically significant. The corruption index has the expected negative sign and is highly statistically significant. If we switch to the indicator variables, the variable “cash per capita” has the expected positive sign but is not statistically significant. GDP per capita has the expected negative sign and is highly statistically significant.

In order to calculate the size and development of the shadow economy in these 11 Central and Eastern European countries we have to overcome the disadvantage of the MIMIC approach, which is that it gives only relative estimated sizes of the shadow economy and it is necessary to use another approach to get absolute figures.

Table 5.2 Size and development of the Serbian shadow economy and of other transition countries (in % of GDP)

Country	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Average
Bulgaria	36.2	35.4	35.2	34.6	34.2	33.5	33.0	32.6	32.9	32.3	33.9
Czech Republic	18.4	18.0	17.6	17.3	17.0	16.4	16.1	15.6	15.9	15.2	16.8
Estonia	32.0	31.6	31.2	31.0	30.6	29.9	29.4	29.2	29.6	29.2	30.4
Hungary	24.3	24.0	23.7	23.4	23.0	22.6	22.4	22.0	22.6	22.1	23.0
Latvia	30.0	29.6	29.3	29.1	28.6	27.8	27.3	26.9	27.2	26.6	28.2
Lithuania	33.0	32.9	32.5	31.7	31.4	30.7	29.8	29.4	29.7	29.3	31.0
Poland	27.5	27.3	27.1	27.0	26.7	26.3	26.1	25.8	25.9	25.6	26.5
Romania	33.4	33.2	32.7	32.3	31.8	30.5	30.2	29.6	29.8	29.5	31.3
Serbia	33.2	32.7	32.1	32.0	31.6	31.2	30.7	30.1	30.6	30.1	31.4
Slovak Republic	18.8	18.5	18.3	18.0	17.7	17.2	16.6	16.3	16.9	16.2	17.5
Slovenia	26.6	26.2	26.1	26.0	25.7	25.3	24.8	24.3	24.6	24.1	25.4
Average per year of 11 countries	28.5	28.1	27.8	26.8	27.1	26.5	26.0	25.6	26.0	25.5	26.9

Source: Own calculations

In order to calculate absolute figures for the size of the shadow economies of these 11 countries from this MIMIC estimation result, we use already available information from the currency demand approach for Hungary, Poland, and Slovenia, and for the other countries from Schneider (2005) and Lackó (2000).

The results of the size and development of the shadow economies of these 11 Central and Eastern European countries are presented in Table 5.2 using Model 1. Table 5.2 clearly shows that in principle we have a declining trend in the size and development of these shadow economies in all 11 countries. As the table is self-reading, only the values for Serbia will explicitly be mentioned here.

The size of the Serbian shadow economy was 33.2 % in 2001 and declined to 30.1 % in 2008, increased in 2009 to 30.6 % and decreased again in 2010 to 30.1 %. A small increase in 2009 is observable for almost all of these 11 countries. The results show that the shadow economy declined in Serbia over the period of economic growth and then stayed almost unchanged after the beginning of the economic crisis. We can also see that over the whole period considered the shadow economy in Serbia is higher than the average values for the selected 11 countries. Only Bulgaria has a higher shadow economy in percent of GDP than Serbia (by 2.2 percentage points in 2010).

Another important result is that the size and development of the Serbian shadow economy between 2001 and 2010 show a strong (highly statistically significant) negative relationship between the size and development of the shadow economy and the size and development of official GDP. If the official GDP decreases by 1 percentage point the shadow economy increases between 0.60 and 0.70 percentage points, depending on the model used. Hence, if the official economy is in a severe recession the shadow economy greatly increases. This is an obvious result, which can be observed in a lot of other studies (compare e.g., Field and Schneider 2010 or Schneider 2011). If the official economy shrinks and if people have less opportunity to earn money in the official economy they will increase their activities in the shadow economy to compensate for the loss from the official economy or to earn extra.

5.3 Estimate of the Shadow Economy Using the Household Tax Compliance Approach⁷

The shadow economy can be estimated in other ways besides the MIMIC model. A frequently utilised approach is the HTC (Household Tax Compliance) method, based on data from macroeconomic accounts. This method estimates the extent of the shadow economy generated by activities in the household sector, and as such is narrower in its scope than the MIMIC model, which also includes other institutional sectors. Any estimate of the shadow economy obtained using the HTC approach is

⁷The methodology applied was described and used in Christie and Holzner (2004).

expected to be lower than that using the MIMIC method, since some informal activity takes place outside the household sector, i.e., in the corporate sector. So, for instance, taxpaying businesses and entrepreneurs can conceal part of their profits, under-report the value of taxable property, engage in trade without declaring VAT and excise duty (e.g., by setting up ‘phantom companies’), etc.

The extent of the shadow economy in the household sector (SEHS), defined as the share of undeclared household income (UHI) in GDP, was calculated as the difference between the total taxable household income (THI) and the declared/taxed household income (DHI), expressed as their respective shares in GDP:

$$SEHS = \frac{UHI}{GDP} = \frac{THI}{GDP} - \frac{DHI}{GDP} = \beta_H - \beta_H \lambda_H = \beta_H (1 - \lambda_H) \quad (5.1)$$

where β_H is the share of total household income in GDP, while λ_H is the ratio of taxed to total i.e., taxable household income. Therefore, to estimate the shadow economy in the household sector, total taxable household income and taxed household income must be estimated first.

The estimate of the amount of taxable household income (THI) was based on the assumption that households can use their income for consumption (THC—total household consumption), savings (SAV), and taxes (TAX). Starting from the fact that data on total household savings are not known in advance for any given year, the amount of savings was estimated by multiplying the net household savings rate (σ) and total household income:

$$\begin{aligned} THI &= THC + SAV + TAX = THC + \sigma THI + TAX \\ &= \frac{1}{1 - \sigma} (THC + TAX) \end{aligned} \quad (5.2)$$

For the purposes of estimating the taxable income of Serbian households we used data on total household consumption presented in national accounts, as published by the Statistical Office of the Republic of Serbia.

The savings rate was calculated as the ratio between total current household savings and total household income. Total current household savings were estimated as the difference between total gross disposable income and total final household consumption,⁸ plus the increase in household financial savings, and less net household liabilities with financial institutions (according to data published by the National Bank of Serbia). Although savings should include other non-financial types of savings, such as investment in durable consumer goods or increase in inventories of non-durable consumer goods, etc., for the purposes of this estimate we assumed, due to lack of data, that 2010 did not see any changes to non-financial household savings. Net savings estimated thus amounted to some

⁸ According to data obtained from the UN database.

4.7 % of gross disposable household income.⁹ Starting from the estimated net savings rate and official data of the Ministry of Finance and Economy on government revenue in the form of personal income tax and social security contributions, we estimated Serbia's total taxable household income (THI).

The estimate of the amount of taxed income was based on the assumption that total government revenue from taxes and contributions (TGR) is the product of total (declared) taxed household income (DHI) and the statutory household tax rate (SHTR), so that the relative extent of total taxed household income can be calculated in the following manner:

$$\frac{DHI}{GDP} = \frac{TGR/GDP}{SHTR} \quad (5.3)$$

Data on total government revenue from personal income tax and social security contributions were taken from official publications of the Ministry of Finance and Economy, while the statutory household tax rate needed to be estimated.

The statutory household tax rate depends on the average personal income tax rate (PITR), the rate of social security contributions payable by employees (SSCR), and the net household savings rate, as well as the average VAT rate (VATR), the average rate of excise duty (EXCR), and the rate of consumption of excise goods (RCEG). It is calculated in the following manner:

$$SHTR = PITR + SSCR + (1 - PITR - SSCR) * (1 - \sigma)(VATR + RCEG * EXCR) \quad (5.4)$$

The average rate of personal income tax was calculated as the weighted average of tax rates applicable to all types of household income, including: wages; pension income; social welfare payments; and income from agriculture, hunting, and fishing, remittances, property, capital gains, gifts, and other income, as well as income in kind and imputed housing rent. Of all these forms of income, tax is levied on wages, income from property, and other income, while other forms of income are non-taxable (i.e., neither income tax nor social security contributions are payable). The weight applied in calculating the average statutory tax rate was the share of particular forms of income in the total income of the population in Serbia. The same approach was used to calculate the average rate of mandatory social security contributions payable by employees.

The average VAT rate was calculated by taking into account the statutory general and reduced VAT rates, the structure of consumption (share of goods and services taxable at the general and reduced rate in total consumption, according to data from the Household Budget Survey), and types of consumption *de facto* not

⁹ If net savings were estimated using data from the Household Consumption Survey, the net savings rate would stand at about 8.4 %, which is close to the figure obtained by CLDS (2012). However, due to the respondents' propensity to underestimate income in these surveys, we felt that more precise estimates could be obtained using macroeconomic accounts.

Table 5.3 Estimate of the shadow economy based on macroeconomic data—HTC method

	Shadow economy
As % of GDP	23.6
In RSD billion	680.3

Source: Own calculations

subject to VAT, such as consumption from own production. The average rate of excise duty was calculated by considering statutory excise rates and the structure of household consumption, where particular excise duties were converted into *ad valorem* rates, using typical excise goods as an example (e.g., starting from the price of an average packet of cigarettes).

Taking formula (5.1) and the relevant variables for 2010 as our starting points, we estimated the total extent of the shadow economy in Serbia at 23.6 % of GDP, or RSD 680.3 billion (Table 5.3). The detailed calculation is provided in the Appendix table. Since the official GDP figures for Serbia are underestimated for various reasons (which will be described in greater detail below), an increase in the GDP would cause a change in the absolute amount recorded in the shadow economy. Thus a nominal increase in registered GDP of 15 % (considered a realistic figure) would raise the shadow economy to RSD 782.5 billion, since the extent of the shadow economy in unregistered GDP is assumed to be nearly identical to that in registered GDP.

The estimated value of the shadow economy based on household consumption and income data was lower by about one-fifth, or some six percentage points of GDP, than that obtained by using the MIMIC method. This difference was primarily caused by the fact that the HTC method does not cover informal activities not reflected in household income and consumption, such as various types of informal activity in the sector of businesses and entrepreneurs. Furthermore, some of the divergence in the estimates can be accounted for by differences in methodology and data sources.

5.4 Estimate of the Shadow Economy Based on the Survey on Conditions for Doing

5.4.1 Business in Serbia

Microeconomic estimates of the shadow economy can be obtained by using data collected from taxpayers themselves or from the Tax Administration on detected evasion. Microeconomic methods are complementary with estimates of the shadow economy obtained through the use of macroeconomic methods. These methods may also provide additional information on which industries see the greatest extent of tax evasion, differences in perceptions of tax evasion depending on the number of employees in a business, type of business entity (enterprises/entrepreneurs), and the

like. Surveys can provide information about taxpayers' views on the extent to which tax evasion jeopardises the equality of market participants, their value judgments and reasons for tax evasion, the efficiency of government bodies, the extent of corruption, etc. This chapter estimates the total volume of the shadow economy in trade in goods and employee wages in the business and entrepreneurial sectors, while Chap. 6 takes a closer look at other aspects of the shadow economy.

Microeconomic methods do, however, have certain drawbacks. The main potential weakness of surveys is the near certainty of respondents being biased downward and thus underestimating tax evasion in their own businesses. In addition, there is the objective issue of the reliability of answers on tax evasion, as they are made from memory and not based on any systematic records. Figures calculated using data on tax evasion uncovered by the Tax Administration are systematically underestimated, since it is clear that only a certain percentage of evasions are discovered.

5.4.2 Estimated Extent of the Shadow Economy in the Trade in Goods

Microeconomic estimates of the extent of the shadow economy in the trade in goods presented in this study are based on the Survey of Conditions for Doing Business in Serbia that covers businesses and entrepreneurs. The survey does not cover individuals, unregistered entrepreneurs, or businesses operating completely in the shadow economy (see Chap. 3). However, it is estimated that this segment of the shadow economy is indirectly included in the estimate of the total volume of informal trading; i.e., trading without the payment of taxes. It is likely that respondents from registered businesses and entrepreneurs included illicit trade with unregistered businesses when estimating the total volume of illicit trade.

As expected, the businesses and entrepreneurs surveyed underestimated the volume of informal trade engaged in by their own businesses. As little as 31 % of businesses and entrepreneurs surveyed responded that they made some payments in cash. The average volume of payments in cash estimated by the 31 % of respondents stood at some 32.1 %. However, if we extrapolate this percentage onto the total number of entities, we can see that cash payments account for about 11 % of all payments—a consequence of the fact that as many as 66.6 % of all respondents claimed that there were no cash payments at their businesses or shops. The next chapter takes a more detailed look at 'shadow trade' for the set of VAT payers, by features of business.

Obviously, regardless of the anonymity offered by the survey, the respondents were less than honest when replying to the question designed to capture the extent of cash transactions at their business/shop. An estimate of informal transactions can thus be obtained on the basis of respondents estimates on the participation of other businesses from the same sector and this estimate could be considered the upper

limit of its likely extent (see Chap. 3). Based on the responses of the surveyed businesses and entrepreneurs, cash payments accounted for about 21.6 % of total payments in their sector of activity.¹⁰

The macroeconomic relevance of illicit trade in the business sector can be gauged on the basis of the share of corporate GDP in total GDP. According to 2010 data, corporate GDP accounted for some 53 % of total GDP (Statistical Office of the Republic of Serbia 2012). If we assume that the share of businesses in the trade in goods is approximately equal to their share in GDP, it follows that illicit trade of 21.6 % implies that the extent of the shadow economy in the trade in goods amounts to 11.6 % of GDP. When interpreting these figures, it must be noted that it reflects the amount of added value avoided, which serves as the VAT base, rather than the value of gross turnover avoided. If the shadow economy were to be estimated on the basis of gross turnover, rather than on added value, it would be taken into account multiple times, which is incorrect from the standpoint of methodology.¹¹ Besides, calculating the extent of the shadow economy based on gross turnover runs counter to the general idea of value added tax, which is designed so that added value, rather than gross turnover, is taken as its base.

5.4.3 Estimated Extent of the Shadow Economy in the Payment of Wages

One of the standard procedures for estimating the shadow economy in the field of taxing personal income is also based on carrying out a survey on a representative sample of taxpayers, although answers obtained in this manner have often been known to underestimate the amount of overall and untaxed income.¹² As employee wages are the dominant form of taxable household income in Serbia, and the taxes and contributions are paid by employers, the gap in personal income tax and contributions was estimated using data obtained in the Survey on Conditions for Doing Business in Serbia. Although this does not cover the portion of the household income shadow economy that is generated through working outside of regular working hours or outside of formal employment (e.g., private lessons given by teachers), the findings can nonetheless serve as an approximate indicator of the

¹⁰ The average estimate of tax evasion was calculated using the weighted average, whereby estimates within an interval were replaced by the median of that interval. In calculating the average amount of tax evasion we excluded non-responses, i.e., respondents who claimed they did not know how much was evaded and those who refused to answer.

¹¹ Estimates of the shadow economy based on gross turnover are probably one of the most significant reasons why the shadow economy is overestimated in public debates in Serbia.

¹² The problem of bias inherent in answers to these questions has been partly resolved by posing implicit questions that relate to the entire sector of activity the respondent engages in, rather than on the respondent alone. However, this method also carries the risk of untruthful answers, or misunderstanding of the concept of sector of activity.

extent of the household income shadow economy, on condition that the extent of non-declaration of other forms of income is similar to that seen with wages.

The extent of the shadow economy in the field of household income is defined as the relative divergence between (total) taxable income and taxed (declared) income in relation to the amount of taxable income. The difference between taxable and taxed income has been defined in the survey as the wage paid to a worker in cash (rather than via a bank account) in the sector of activity in which the particular business entity operates. Thus, the extent of the shadow economy in the field of household income is an indicator of the ratio of undeclared to declared household income, and, as such, shows how widespread the shadow economy is in this field. As respondents were able to choose between intervals of figures for this rate for the sector of activity they operate in, the average weighted amount was calculated using the median of the intervals, as well as a weight based on the frequency of respondents selecting a particular interval.

As reported in the survey, the average extent of the shadow economy in wages (the ratio between undeclared and total actual income from labour) stands at 26.2 %.¹³ On average, this is higher with entrepreneurs, i.e., wages paid by entrepreneurs, than with businesses (Fig. 5.2). When viewed by sector of activity, the extent of employee wages paid in the shadow economy is the highest in construction, catering, and transportation, much lower in production, and lowest in businesses engaging in trade. Moreover, the payment of wages in cash is the most widespread in micro-businesses and by entrepreneurs, and, as businesses grew, the extent of wages paid informally decreased. In addition, when the data are viewed by region, the results show that ‘envelope wages’ were more common among employers in Central Serbia than those based in Vojvodina or Belgrade. The Tax Administration should take into account this structure of informal employment when designing an audit system.

The share of gross wages in the sectors of businesses and entrepreneurs in GDP can be used to estimate the share of avoided wages paid by the business sector in GDP. Wages account for some 51 % of GDP, while wages paid by businesses make up some 70 % of all wages. When the 26.2 % rate of informal wages paid by businesses is applied to this figure, it can be estimated that the extent of the shadow economy in the payment of wages by businesses stands at 9.4 % of GDP.¹⁴

¹³ According to data from the 2007 Living Standards Measurement Study, the rate of underreporting of income (% of unreported income in relation to reported income) stood at 26.9 % in Serbia, which underlines the robustness of estimates of the extent of the shadow economy in the field of household income (Randelović 2011).

¹⁴ If we take into account the percentage of workers without formal employment contracts whose wages are paid wholly in cash (23.9 %), and assuming that the respondents did not include them in their estimates, but rather referred only to workers with a portion of wages paid in cash, the percentage of wages paid in cash rockets to 43.8 %. This means that the aggregate estimate of the shadow economy in the payment of wages also increases, to 15.6 % of GDP. A more detailed overview of the methodology used can be found in Putninš and Sauka (2011).

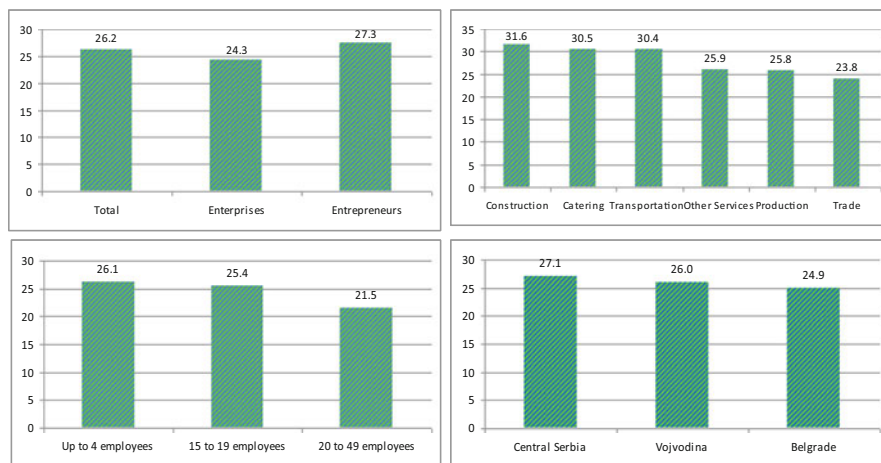


Fig. 5.2 Extent of the shadow economy in wages, based on the Survey on Conditions for Doing Business in Serbia. *Source:* Own calculations. Survey on Conditions for Doing Business in Serbia, FREN 2012

5.4.4 Summary Estimate of the Shadow Economy in the Sector of Businesses and Entrepreneurs

Based on the Survey of Conditions for Doing Business in Serbia, it is estimated that the extent of the shadow economy in the sector of businesses and entrepreneurs with respect to the trade in goods and the payment of wages stands at some 21.2 % of GDP (Table 5.4). This estimate covers the greatest portion of informal activity of businesses and entrepreneurs, but not all types of such activity. The other types of companies' informal activity, including the evasion of corporate income tax, property tax, and various fees and charges, probably collectively account for 10–15 % of the volume of informal activity in the trade in goods and payment of wages.

As expected, the extent of the shadow economy in the sector of businesses and entrepreneurs estimated using the findings of the survey was lower than that estimated using the MIMIC and HTC methods. This is because the MIMIC model takes into account all institutional sectors and all types of informal activity, while the survey only looks at the shadow economy among businesses and entrepreneurs (and not among households), and takes into account only the most important types of informal activity, illicit trade in goods and under-reporting of wages.

Table 5.4 Estimated extent of the shadow economy in the sector of businesses and entrepreneurs, based on the Survey on Conditions for Doing Business in Serbia

	As % of GDP
Total extent of shadow economy	21.2
Shadow economy in trade in goods	11.6
Shadow economy in payment of wages	9.6

Source: Own calculations

5.5 Estimate of the Tax Evasion Gap

5.5.1 Introduction

The tax gap is the difference between hypothetical (theoretical) tax revenue and taxes actually collected. Hypothetical tax revenues are sums that would be collected over a particular period of time provided that all taxpayers pay their taxes in full compliance with tax legislation. However, the tax gap is also made up of other elements in addition to tax evasion, for example, taxes declared but unpaid and tax revenue lost due to taxpayer insolvency, but their significance to the balance is mostly low. In the case of Serbia, taxes declared but unpaid may have a relatively large share due to widespread fiscal indiscipline, and also because of the tolerance of non-payment by some groups of taxpayers (businesses undergoing restructuring, poorer individuals, etc.). In this study we have focused on estimating the tax gap without going into whether it is caused by evasion or non-payment of declared taxes.

We have estimated the tax gap for the most important types of tax in Serbia: value added tax (VAT), social security contributions, and personal income tax. The share of these taxes in Serbia's total tax revenue is about 80 %. The tax gap was not estimated for another important tax, excise duty, which has a share of some 15 % in total tax revenues. Estimating this tax gap would have required detailed assessment by groups of excise product (oil products, cigarettes, alcoholic beverages, etc.), which would have gone beyond the scope of this survey.

The application of various methods resulted in an estimate of 7.5 % of GDP for the total VAT, personal income and social security contributions tax gap. Of this amount, the income tax and contributions gap amounted to some 5 % of GDP, while the VAT gap stood at about 2.5 % of GDP. Assuming that the extent of evasion was slightly lower for other taxes (excise duty, customs duty, corporate income tax, property tax, fees, charges, etc.), we estimate that the total tax gap stands at some 11 % of GDP, or, rather, that the sum total of taxes evaded and those declared but not paid amounts to about €3 billion per year.

5.5.2 *Estimate of the VAT Gap*

The VAT gap is the difference between the hypothetical (theoretical) VAT assessed and the amount actually collected. The VAT gap will be estimated using macroeconomic aggregates (with a top-to-bottom approach), as well as on the basis of microeconomic data obtained from a survey of VAT payers.

5.5.2.1 **Estimating the VAT Gap Based on Macroeconomic Aggregates**

Methodology for Estimating the VAT Gap

The macroeconomic estimate of the VAT gap was made using methodology applied to EU member states (Reckon 2009); other institutions use similar methodologies (HM Revenue & Customs 2011). According to this methodology, the starting point for estimating the VAT gap is the system of national accounts, as well as disaggregated data on the consumption of various products by household. Thus the reliability of such estimates is critically dependent on the quality of information found in the national accounts and the Household Consumption Survey. One advantage of estimating the VAT gap on the basis of macroeconomic accounts rather than other methods of assessment is that it includes VAT contained in all components of aggregate demand (household consumption, investment, other consumption) and across all institutional sectors (households, businesses, government). Under the macroeconomic approach the total hypothetical VAT is equal to the sum of the hypothetical VAT contained in household consumption, fixed investments, and other consumption. VAT figures obtained by these means are then adjusted for several factors, such as small taxpayers exempted from VAT, purchase of business car fleets and other goods not subject to a refund of input VAT, specific areas of taxation in some countries, etc.

The most important macroeconomic basis for calculating VAT is household consumption, which is financed from household income but also includes consumption funded by non-governmental organisations (such as the Red Cross, religious communities, and other NGOs). Hypothetical VAT contained in household consumption accounts for by far the largest portion of total hypothetical VAT in EU countries, averaging 64 %. The share of household consumption VAT in hypothetical VAT has been stable, both by year and by country. The coefficient of variation of the share of EU25 hypothetical VAT on household consumption in total EU25 VAT amounted to a mere 9.1 % between 2000 and 2006.¹⁵

Another significant macroeconomic base for VAT is made up of fixed investments. Although this is generally exempt from VAT, some of them contain substantial VAT. Most VAT is accounted for by investments made by non-VAT payer entities, such as private individuals, small-scale entrepreneurs, and the like.

¹⁵ Calculation based on Reckon (2009).

The most important component within this group is investment in the construction and purchase of housing. In addition, in many countries (Serbia included) VAT payers are required to pay VAT on fixed assets that can be used for private purposes, such as cars, furniture, etc. The share of VAT contained in fixed investments in EU member states stood at 14.7 % on average between 2000 and 2006, but variations between individual countries were substantial, with the coefficient of variation standing at 32 % on average. Such relatively high variation was caused by both fluctuations in investment and the differing tax treatment of some investments, such as the purchase of cars or furniture by taxpayers.

The third significant macroeconomic base for VAT is other consumption. Within this factor the most significant areas are private household consumption provided by the state through transfers in kind, collective consumption, and financial services. Private consumption provided by the state in kind includes various types of service provided by the state to private individuals, the most important being healthcare, education, and social security, as well as sports and cultural needs, which are less significant. All of these services have the features of private goods, but the state provides them to the public for various reasons (goods egalitarianism, exogenous effects and information asymmetries, etc.). Collective consumption comprises public goods, such as defence, internal security, justice, etc. that the state also provides to citizens. Added value in the financial sector is not yet subject to VAT, but there have been calls to remove this exemption.

VAT is not charged on the added value of private goods provided by the state, collective consumption, and financial services, but VAT contained in the inputs is not deducted as input VAT. This means that VAT is not payable on education, healthcare, internal and external security, justice, and financial services; however, the costs of the delivery of these services include VAT payable on inputs such as fuel, medications, utilities, office supplies, etc. Hypothetical VAT contained in other consumption is a major component of overall hypothetical VAT, with an average share of 19.6 % in the EU25 between 2000 and 2006. However, the variation in the share of hypothetical VAT on other services in total hypothetical VAT is relatively high—the coefficient of variation amounts to 25 %.

Hypothetical VAT contained in each macroeconomic base (household consumption, fixed investment, and other consumption) is obtained by multiplying the tax base and the average weighted statutory tax rate for each tax base. As VAT is included in these bases in macroeconomic accounts and consumption data, recalculated statutory tax rates must be used instead of the original ones.¹⁶

¹⁶ The general statutory rate in Serbia stood at 18 % at the time the analysis was carried out, while the recalculated statutory rate amounted to 15.2 % = $18/(100 + 18) * 100$. All estimates were made using the statutory rates in force in 2011.

Estimation of the VAT Gap in Serbia

In estimating the VAT gap in Serbia in accordance with methodology applied in EU member states (Reckon 2009), particular attention was paid to estimating the hypothetical VAT contained in household consumption. This approach was both justified, since nearly two-thirds of total VAT is accounted for by household consumption, and feasible, as data on the detailed structure of household consumption are available, unlike those regarding the structure of investments and other consumption.

The starting point for estimating hypothetical VAT was the set of data on household consumption by product group (Radisavljević 2010) adjusted to household consumption data from national accounts, as well as the Law on VAT. This piece of legislation stipulates which products attract the standard rate or the reduced rate, and which activities are VAT exempted without credit (government services, financial services, etc.). The average statutory VAT rate was estimated on the basis of the Law on VAT and the structure of consumption for each product group. We obtained the value of the hypothetical VAT for each product group by multiplying the average statutory VAT rate for that product group (e.g., food and soft drinks) with the value of consumption for that group. In the case of food and soft drinks, we also took into account the fact that households obtain a portion of consumption from their own production: this is termed in-kind consumption. No VAT is payable on the added value of these products, but some VAT is contained in inputs (fuel, seeds, crop protection, cattle feed, etc.) used to produce these mainly agricultural products; we took this into account when estimating the average VAT rate applicable to this group of products. We assumed that imputed rent, which has a share of close to 11 % in personal consumption (Radisavljević 2010), did not contain any VAT, i.e. that the tax rate was equal to zero.

Hypothetical VAT on fixed investment was estimated on the basis of the share of fixed investment in Serbia's GDP and the average share of VAT contained in investment in new EU member states. This approach was used because there are no data for Serbia on the structure of investment by type of investor (VAT payers vs. others) or product (amounts of investment in products not exempt from VAT—cars or furniture purchased by VAT payers, etc.) that could be used to estimate the share of VAT in them.

Value added tax contained in other consumption (private and collective consumption provided by the state, financial services) was estimated under the assumption that the value of the inputs taxed amounted to 60 % of the added value in the respective sectors of activity. In addition, we have assumed that these activities used inputs taxed at an average VAT rate of 14 %.

Adding together the VAT contained in household consumption, fixed investment, and other consumption yields total hypothetical VAT. Total hypothetical VAT is then adjusted with the aim of correcting for standard exemptions and special tax regimes that are part of the VAT system. The most important adjustment is the reduction in total hypothetical VAT for VAT contained in the added value of entrepreneurs and businesses below the VAT entry threshold. These businesses and

entrepreneurs do not pay VAT on their own added value, but are also unable to claim refunds of VAT paid on their inputs. The correction also takes into account the fact that businesses that purchase cars are not able to claim VAT refunds. As there are no data for Serbia that would make it possible to make these adjustments, we applied an average adjustment rate of 3.5 % of the total hypothetical VAT, which is slightly above the EU average.

The application of this procedure resulted in an estimate of the hypothetical VAT of Serbia between 2008 and 2011. We calculated the VAT gap by subtracting actually collected VAT from hypothetical VAT; this gap was made up mainly of evaded VAT, as well as VAT declared but not paid. Based on official statistics of macroeconomic aggregates and consumption and using the above methodology, the VAT gap in Serbia between 2008 and 2011 was found to range between 7.3 and 9.4 % of the hypothetical VAT, with an average value of 8.6 % (Table 5.5). The estimated VAT gap in Serbia amounted to just about 1 % of GDP.

The VAT gap calculated in this manner for Serbia was significantly lower than the EU25 VAT gap seen between 2000 and 2006, which stood at 13.5 % of the hypothetical VAT on average. The difference is even more marked in relation to the eight new Central and Eastern European member states, where the average VAT gap¹⁷ was 19.3 % in 2000–2006.

The VAT Gap and Registered GDP

The fact that the VAT gap is much smaller in Serbia than in EU member states could be caused by an underestimated macroeconomic base (household consumption and investment) in Serbia, or by exceptionally low tax evasion and small amounts of tax declared but not paid. It is perfectly clear that the low VAT gap estimated in Serbia was caused by an underestimate of the GDP and its elements that are subject to VAT. Unlike EU member states, Serbia does not include a portion of the shadow economy in the calculation of its GDP. Yet another indication of the fact that underestimated GDP was the primary cause of the low VAT gap in Serbia can be gleaned by comparing the share of actually collected VAT in Serbia with that in EU member states. The share in Serbia was among the highest in Europe, although Serbia's VAT rate was among the lowest.

The hypothetical VAT in investments and other consumption was calculated using the appropriate parameters for EU member states.

The structure of the hypothetical VAT in Serbia differs from the EU average. VAT contained in household consumption has a relatively high share in the hypothetical VAT, while the share of VAT in investments and other consumption is lower than the EU average (Table 5.6). This difference is the consequence of the

¹⁷ The average VAT gap for EU25 and the eight new CEE member states was calculated as the unweighted average of data obtained by Reckon (2009).

Table 5.5 Estimate of hypothetical VAT, in millions of RSD

	2008	2009	2010	2011
Hypothetical VAT, total	325,370	328,832	347,515	377,597
VAT in household consumption	227,973	238,396	253,978	276,866
VAT in fixed investments	41,107	33,165	33,299	35,290
VAT in other consumption	44,892	45,351	47,603	52,048
Net adjustment	11,399	11,920	12,635	13,393
Actual VAT	301,700	296,900	319,400	342,000
VAT gap, in millions of RSD	23,670	31,932	28,115	35,597
VAT gap, in % of hypothetical VAT	7.3	9.7	8.1	9.4

Source: Own calculations. Calculated using macroeconomic data, household consumption data, and Law on VAT

Table 5.6 Structure of hypothetical VAT, in %

	2008	2009	2010	2011
Hypothetical VAT, total	100.0	100.0	100.0	100.0
VAT in household consumption	70.1	72.5	73.1	73.3
VAT in fixed investments	12.6	10.1	9.6	9.3
VAT in other consumption	13.8	13.8	13.7	13.8
Net adjustment	3.5	3.6	3.6	3.5

Source: Own calculations

large share of personal consumption in Serbia's GDP relative to the EU average. In 2009, household consumption in Serbia had a share of 77 % of GDP, while on average this figure was 57 % in EU member states (Radisavljević 2010). The share of household consumption in GDP was greater in Serbia than in any EU member state, which was probably caused by specific factors; however, error cannot be ruled out when estimating GDP or some of its components, such as investments. Key factors affecting the high share of household consumption in GDP are the high share of wages, pensions, and remittances in GDP.

To obtain a more realistic assessment of the amount of hypothetical VAT, and thus of the VAT gap, while ensuring international comparability, official GDP data for Serbia must be adjusted in line with ESA 95 methodology. This entails increasing the official GDP by a portion of the shadow economy¹⁸ etc. included in the GDP in countries that apply EU or United Nations methodology. According to the latest estimate of the unobserved economy carried out in Serbia by the Statistical Office of the Republic of Serbia for 2003–2005, the GDP would be greater than the official GDP by between 13.5 and 16.2 % if a portion of the shadow and unregistered economy were included, as is done in other countries.¹⁹ Although the estimate of the unobserved economy relates to a period of nearly a

¹⁸ For a more detailed discussion, see the overview of activities not included in GDP in developing countries in United Nations (2008).

¹⁹ Website: http://www.stat.gov.rs/nacionalni_racun.

decade ago, adjustments made to Serbia's official GDP will be based on it in the absence of newer research. The official GDP of Serbia, therefore, rose by 15 % between 2008 and 2011.

The increase in GDP by components of final use approach was differentiated: investments increased by 20 %, household consumption by 16 %, and other consumption by 5 %. The above-average adjustment in investments was caused by the great extent of the excluded shadow economy in the construction industry, encompassing businesses, entrepreneurs, and households equally. The adjustment in household consumption was slightly greater than the average adjustment of GDP, while other consumption saw a relatively modest adjustment, since it was dominated by consumption provided by the state. Individual forms of consumption recorded different levels of adjustment: above-average adjustment was seen in the consumption of clothing and shoes²⁰ and in the sectors of catering, personal services, and food; below-average adjustment, on the other hand, was recorded in the consumption of utilities, telecommunications services, etc. These differentiated adjustments of particular forms of household consumption are important, since various forms of consumption are taxed at different average weighted statutory tax rates.

The hypothetical VAT was estimated on the basis of adjusted household consumption, investments, and other consumption, using the methodology described above. As expected, based on the adjusted macroeconomic bases, it was found that the hypothetical VAT was greater by some 15 % in relation to the hypothetical VAT obtained on the basis of official VAT data. The estimated VAT gap between 2008 and 2011 amounted to 20.6 % on average (Table 5.7), which was much greater than the EU25 average, which stood at 13.5 % between 2000 and 2006.²¹ However, it is more relevant to compare Serbia with similar EU member states,²² where the VAT gap amounted to 18.1 % between 2000 and 2006. It is also pertinent to note that the VAT gap in these countries stood at 19.3 % in 2000–2003, before their accession to the EU (Reckon 2009).

The macroeconomic relevance of the estimated VAT gap can be assessed by its share in GDP. The use of adjusted GDP shows that the VAT gap in Serbia stood at, on average, 2.5 % of adjusted GDP (or 2.9 % of official GDP) between 2008 and 2011. The VAT gap estimated using adjusted GDP is nearly three times as high as that found using official GDP data.

According to the Survey on Conditions for Doing Business in Serbia, businesses and entrepreneurs estimated that the extent of informal transactions in their respective sectors of activity stood at some 22 % of the total volume of transactions. This

²⁰ These products are sold in large quantities at flea markets, or even in high-street shops, without VAT being paid. However, the products—mainly imported from abroad—may contain some VAT paid at the time of import, probably using an underestimated base.

²¹ Calculated as the unweighted average of data from Reckon (2009).

²² The Czech Republic, Poland, Slovakia, and Slovenia. An even more relevant comparison would involve Romania and Bulgaria, but data for these countries are not available.

Table 5.7 Estimate of hypothetical VAT using adjusted base, in millions of RSD

	2008	2009	2010	2011
Hypothetical VAT, total	374,389	377,527	399,979	434,538
VAT in household consumption	268,771	280,458	295,507	322,137
VAT in fixed investments	49,328	39,798	39,958	42,349
VAT in other consumption	44,892	45,351	49,983	546,499
Net adjustment	11,399	11,920	14,530	15,402
Actual VAT	301,700	296,900	319,400	342,000
VAT gap, in millions of RSD	72,689	80,627	80,579	92,538
VAT gap, in % of hypothetical VAT	19.4	21.4	20.1	21.3

Source: Own calculations. Calculated using macroeconomic data, household consumption data, and Law on VAT. Hypothetical VAT contained in investments and other consumption calculated using appropriate parameters for EU member states

estimate supports the estimate of the tax gap made on the basis of adjusted macroeconomic data, whereby the VAT gap in Serbia is seen to amount to some 21 % of hypothetical VAT.

5.5.3 Estimated Personal Income Tax and Social Security Contributions Gap

As has already been mentioned, the term ‘tax gap’ is narrower than ‘shadow economy’, since the shadow economy denotes income that is taxable by law but is not declared or taxed, while the tax gap denotes the amount of tax evaded expressed as a percentage of hypothetical tax revenue. The income tax and contributions gap is defined as the difference between the hypothetical amount of income tax and social security contributions that could be collected (if all income taxable under law were actually taxed) and the amount of income tax and contributions actually collected. The income tax and contributions gap can be estimated if we first estimate the extent of the shadow economy in the payment of wages, using data from the survey (the amount of income not taxed) and the statutory average rates of tax and contributions payable on such income. Since the survey covered exclusively income from labour, only such income was taken into account in calculating the statutory tax rate.

Starting from the extent of the shadow economy in the payment of wages estimated using the survey (26.2 %) and the total amount of gross wages earned by employees stated in the national accounts, we were able to estimate the total extent of the shadow economy in the area of income from labour (approximately 9.4 % of GDP, or some RSD 313 billion). By applying the average statutory tax rate for taxable income from labour to this figure, we arrived at a figure of 4.1 % of GDP (or RSD 135.7 billion) as an estimate of the personal income tax and social

Table 5.8 Estimated personal income tax and social contributions gap, based on the Survey on Conditions for Doing Business in Serbia

Income tax and contributions gap (as % of GDP)	4.1
Income tax and contributions gap (as % of hypothetical amount of income tax and contributions)	22.7

Source: Own calculations

contributions gap, or 22.7 % of the hypothetical revenue from personal income tax and all social security contributions (Table 5.8).

The total amount of the income tax and contributions gap is probably slightly higher than the estimated 4.1 % of GDP, since there are other types of informal activity in the area of labour income that contribute to the income tax gap which are not covered (e.g., self-employment after formal working hours such as private tuition by schoolteachers, etc.). Moreover, evasion is also present in taxation of income from capital (e.g., undeclared interest income from lending money informally, or dividends earned from unregistered corporate income, etc.) Since income from wage employment and self-employment dominated total personal income, the total personal income tax and social contributions gap is estimated to stand at about 5 % of GDP (or 27.7 % of the hypothetical amount of income tax and contributions).

Shadow Economy, Tax Evasion, and the Tax Gap

‘Shadow economy’, ‘tax evasion’, and ‘tax gap’ are related but distinct concepts, and as such are sometimes confused by the general public, which can lead to misunderstandings. The shadow economy, from the taxation standpoint, is the value of taxable activities (labour, trade, etc.) and rights (ownership of property, etc.) on which tax is not paid, although they are statutorily taxable. Tax evasion is the difference between the tax liabilities of a taxpayer under current laws, and their reported tax liabilities; in the case of total evasion, the tax liabilities reported equal zero. The tax gap is the difference between the tax evaded and the amount of statutory tax liabilities (‘hypothetical tax’).

We will present two hypothetical examples to clearly underline the distinction between shadow economy, tax evasion, and tax gap. If earned income amounting to RSD 100 is fully evaded, given a fiscal burden on labour of 40 %, the shadow economy amounts to 100 dinars, while the tax gap stands at RSD 40 (i.e. 100 % of the statutory tax liability). In the case of turnover of RSD 100, of which half was made informally, given a VAT rate of 20 %, the absolute amount of the shadow economy is RSD 50, the evaded tax amounts to RSD 10, while the tax gap stands at 50 %. As can be seen from these examples, the percentages of the shadow economy and the tax gap are identical, and stand at 100 and 50 %, respectively, but their absolute values differ greatly. The absolute value of the shadow economy is greater than the

(continued)

tax evaded by the amount of the reciprocal value of the tax rate, so that, for instance, given a VAT rate of 20 %, the shadow economy is five times greater than the tax evaded ($1/0.2 = 5$).

In the case of Serbia, the MIMIC method resulted in an estimate of 30 % of GDP for the shadow economy, or €10 billion, while the total tax gap in Serbia was estimated to stand at about 10 % of GDP, or about €3 billion. It follows from these estimates that the total implicit tax rate (the ratio of the tax gap to the shadow economy) stands at 33 % in the shadow economy in Serbia, slightly lower than the total tax rate in the formal sector, which amounts to between 37 and 38 %.

Appendix

Estimation of the shadow economy in household income, based on macroeconomic data (Household tax compliance method)

Description	Designation	2010 (RSD million, at current prices)
GDP at current prices	GDP _{MP}	2,881,891
Estimated total household income	THI = THC + Savings + Paid taxes = THC + σ*THI + Paid Taxes	
Total household income, National accounts		2,703,013
Total household consumption, National accounts	THC (total household consumption)	2,686,493
Total household income, HBS		2,703,013
Total household consumption, HBS		2,686,493
Change in household deposits (12/2010-12/2009)		165,141
Change in household liabilities (12/2010-12/2009)		101,859
Net household savings		79,802
Net Household Savings Rate	SVR	0.03
Taxes paid by households	Paid taxes	772,483
Income tax		139,376
Contributions		161,507
VAT		319,400
Excise duties		152,200
Total household income	THI = (1 / (1 - SVR)) * (THC + Paid Taxes)	3,564,203
Estimated statutory household tax rate	SHTR = AIT + ESS + (1 - AIT - ESS) * 1 - SVR) * (VAT + ECR * AET)	
Estimated income tax rate	AIT	0.046

(continued)

Description	Designation	2010 (RSD million, at current prices)
Average rate of contributions payable by employees	ESS	0.096
Average VAT rate	VAT	0.11
Average excise rate	AET	0.484
Rate of consumption of excise goods	ECR	0.087
Statutory household tax rate	SHTR	0.27
Statutory household tax rate (inc. employer SSC)		0.363
Total household tax revenues	THTR = ITR + SSR + VAR + ETR	772,483
<i>Income tax</i>	<i>ITR</i>	139,376
<i>Contributions</i>	<i>SSR</i>	161,507
<i>VAT</i>	<i>VAR</i>	319,400
<i>Excise duties</i>	<i>ETR</i>	152,200
Estimated shadow economy due to households		
Percentage of declared household income	$\lambda_H = DHI / THI = THTR / (THI * SHTR)$	0.81
Total household income (as % of GDP)	$\beta_H = THI / GDP$	1.24
Shadow economy in households sector (as % of GDP)	SEIH = $\beta_H(1 - \lambda_H)$	23.6
Volume of shadow economy in households sector (RSD million)		782,443
Estimated total tax gap		
Total tax gap (RSD million)		284,348
Total tax gap (% GDP)		11.3
Total tax gap (% of hypothetical tax revenues)		23.3

Source: Own calculations

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