Maastricht Criteria and the Inclusion of Underground Economy the Case of Croatia^{*}

Željko Lovrinčević** Zdravko Marić*** Davor Mikulić****

Abstract

European Union has introduced an explicit obligation for all member states that the official GDP data need to include the estimation of the underground economy, resulting from statistical or economic reasons. For this purpose, the socalled Eurostat Exhaustiveness programme has been developed for the group of candidate countries, ten of which have become full members as of the 1st of May 2004. In line with the results of this programme, the new EU members include the correction for the value of the underground economy into their official GDP figure.

With the inclusion of underground economy, the consequent value of Croatian GDP per capita, measured according to the purchasing power parity, reduces the gap in comparison to the EU-25. Furthermore, the proportion of total expenditures in GDP of the general government sector is reduced as well, which

^{*} This paper was originally published in Privredna kretanja i ekonomska politika (Economic Trends and Economic Policy), No. 106, 2006, pp. 28-66.

^{**} Željko Lovrinčević, Research Associate, The Institute of Economics, Zagreb.

^{***} Zdravko Marić, Research Assistant, The Institute of Economics, Zagreb.

^{****} Davor Mikulić, Research Associate, The Institute of Economics, Zagreb.

Note: At the time this paper was being made, Zdravko Marić worked as a Research Assistant at the Institute of Economics, Zagreb. Meanwhile, he has been appointed Assistant Minister in the Ministry of Finance of the Republic of Croatia.

places Croatia below the NMS-8 country average. In terms of the Maastricht convergence criteria, the underground economy inclusion procedure does not affect the fact that the criteria are not met. The inclusion of the underground economy influences two indicators: proportion of the government sector deficit in GDP and the proportion of the public debt in GDP. The inclusion of the underground economy does not influence on fulfilling the criteria concerning the government sector deficit. The criteria concerning the size of public debt are fulfilled by Croatia even without the inclusion of the underground economy. Inflation criteria and the size of long-term interest rates criteria are not directly linked to the GDP value.

Keywords: Maastricht criteria, underground economy, Croatia JEL classification: E01, E26, E61

Introduction

1

In every economy there is a certain part of economic activity which is not included in standard statistical system, although according to the comparable international methodology it should be part of the gross domestic product (GDP). The reasons for this exclusion may vary, but regardless of what they are, the term underground economy encompasses such activities which are not included in the national accounts, but should be included according to the international methodology of calculation.

GDP figures which do not include underground economy may lead to a wrong conclusion on the level of development of an economy, but also on the total economic activity, which can result in serious consequences. The level of development measured by per capita GDP is particularly important in the context of EU integration, because most claims, entitlements and obligations towards EU funds depend on the official per capita GDP.

The total GDP of a country should include an estimate of the extent of underground economy. This is in line with the recommendations of international institutions working on methodological development and improvement of the system of national accounts, as well as with the obligation imposed on all EU candidate countries to include an estimate of the size of underground economy into their official GDP figures.¹ At the same time, the inclusion of underground economy into official statistics should be seen as a starting point for the development of an economic policy aimed at reduction of tax evasion, but also at alleviating the consequences caused by incorrect data on the macroeconomic framework.

This paper presents the consequences of underground economy by comparing basic macroeconomic data on Croatia and the new EU member states which were obliged to correct their official GDP to include the estimate of underground economy before EU accession. Because of this, official indicators of basic

¹ System of National Accounts 1993, sect. 6.30-6.36, Eurostat, European Union (2002 Exhaustiveness Project).

macroeconomic movements in Croatia are not entirely comparable with the data on this group of countries.

The first part of this paper gives an overview of literature dealing with the consequences of development of underground economy. The second part presents methods for estimation of underground economy, with a focus on Eurosat's Exhaustiveness programme designed specially for candidate countries. According to this programme, all countries are obliged to correct their official GDP figure by an average of 12.1 percent before EU accession. The results of the application of the Eurostat method on Croatia are presented in the third part, while the last part deals with the effect which the inclusion of underground economy into official GDP figure for Croatia would have on basic macroeconomic indicators in the context of comparison with the new EU member states.

2 Consequences of Development of Underground Economy

In addition to direct consequences of development of underground economy, which primarily manifest themselves in a loss of tax revenues, indirect consequences can sometimes be equally important. This primarily refers to distortions of the system of statistical information of an economy, which can have serious consequences for the formulation of economic policies.

The increased share of underground economy has a direct impact on reduction of state revenues. If the government sector expenses can be reduced as a result of this, the deficit in revenues will be reflected in the reduction of total government services provided to the rest of the economy. If, what is more usual, the expenditures cannot be reduced, the growth of the unofficial part of the economy will cause a budget deficit with all its negative side effects.

In the attempts to establish a desired level of government consumption, tax authorities usually react by compensating for the loss of tax revenues caused by the increase in underground economy by increasing taxes. This, in turn, additionally burdens the tax-paying part of the economy, thereby increasing its costs and reducing its competitiveness. In such a case, a further increase in tax rates includes the risk of further stimulating the growth of underground economy.

An empirical analysis by Loayza (1996) shows that a significant reduction of underground economy leads to a significant increase in tax revenues and therefore to improved level and quality of public services, which are crucial for economic growth. The analysis shows that countries with the official tax burden higher than the so called "optimum" tax burden and with a low capacity of public administration to enforce the law have a slower GDP growth, and a growing natural rate of unemployment. The author establishes empirically that a growth of underground economy in Latin American countries of 1 percentage point causes a 1.22 percent decrease in the official GDP figures. The growth of underground economy has an adverse influence on the growth rate by decreasing the availability of public sector services for all economic subjects, i.e. by inefficient use of financial resources.

However, the hypothesis of the adverse impact of the informal sector on economic growth is not widely accepted. The Loayza research was criticized for postulating that production technology depends on tax financed public services, which is contrary to the definition of public good. Arsea (1996) presents the opposite opinion on the positive effect of underground economy on economic growth, concluding that informal economy can contribute to the development of the market, increase sources of financing, strengthen entrepreneurship and positively influence institutional changes.

Adam and Ginsburgh (1985) establish a positive relationship between the growth of underground and official economy, and conclude that, under certain conditions (low cost of entry into underground economy), expansive fiscal policy can have a similar effect on both the official and the underground economy. Fichtenbaum (1989) claims that the slowdown of productivity in the US in the period between 1970 and 1989 is overrated, since it does not take into consideration the fast growth of underground economy. Regarding the positive side effects of underground economy on official economy, Schneider (2000) demonstrates that over 66 percent of all income earned in underground economy is immediately

spent in the official economy. Bhattacharyya (1999) establishes a significant effect of underground economy on personal consumption in Great Britain. Underground economy has a positive effect on the consumption of perishable (non-durable) goods and services, but an even more important one on the consumption of consumer durables. Similar empirical conclusions on mutual influence of the official and unofficial economy are given by Tanzi (1999). Although some authors include the function of a social shock-absorber among positive sides of underground economy in transitional countries, alleviating negative impacts of transition, this opinion is also criticized by authors who believe that underground economy cannot be considered a social shock-absorber alleviating the problem of unemployment.²

From statistical point of view, underground economy is also related to the possibility of comparison among countries in time and space. Without a good estimate of underground economy, comparisons among countries may lead to wrong conclusions on the relative welfare of a country. Membership fees in international associations are frequently liked to the average per capita income, and the financial participation of countries can be disproportionately allocated if countries have differently sized unofficial sector of economy.

A good system of statistical information is necessary for economic analyses, but also for monitoring the economy and designing macroeconomic policies. On the basis of incomplete or even false data, analyses can lead to wrong conclusions, which can result in serious consequences if they are subsequently used for determining economic policies.

This paper explores, on the example of Croatian economy, whether the use of a distorted statistical information system based on the use of official GDP figures can influence the speed of fulfilment of the Maastricht criteria, and the introduction of the euro as the official currency.

² For the social role of underground economy in Croatian economy see Karajić (2002) and Bejaković (1997).

Various Methods for Measuring Underground Economy – A Comparison of Results

There are various methods for estimating underground economy. The optimum method for a country depends on the features of its economy, and its tax and legal system. Based on some common features, the methods can be classified in the following way:³

a) Direct methods:

3

- surveys,
- tax audit.
- b) Indirect methods:
 - tax statistics and national accounts difference,
 - income-expenditure difference a macro-approach,
 - income-expenditure difference a micro-approach,
 - labour market,
 - cash in circulation,
 - the transaction method,
 - the input method.
- c) Causal models:
 - cash demand,
 - determinants/indicators.

3.1 Underground Economy in Developed Market Economies

The interdependence of results, as well as systematic overestimation or underestimation resulting from individual methods of calculation of underground economy, are best demonstrated as a comparison of results on a homogeneous group of countries over a longer period of time. One such comparison is given in Table 1.

³ See e.g. Schneider (2002).

| Countries, U 1970-1990 | sing Nine D | ifferent Mo | ethods, for the | Period | |
|---------------------------------|----------------|--------------|-----------------|--------|------|
| S | ize of undergr | ound economy | / (in % of GDP) | | |
| Method | Canada | Germany | Great Britain | Italy | USA |
| Household survey | 1.3 | - | - | - | 5.6 |
| Tax audit | 2.9 | - | - | 5.4 | 8.2 |
| Income-expenditure diff. | - | 13.4 | 4.2 | 5.6 | 6.1 |
| Employment data | - | 34.0 | - | 18.4 | - |
| Input method | 11.2 | 14.5 | 13.2 | 19.3 | 8.8 |
| Tanzi method | 8.1 | 8.3 | 7.9 | 15.8 | 4.7 |
| Gutmann method | 14.9 | - | 9.1 | 26.6 | 11.5 |
| Transaction approach (Feige) | 21.1 | 25.0 | 15.3 | 26.5 | 20.9 |
| MIMIC | 8.7 | 6.7 | 8.0 | 10.5 | 8.2 |

Table 1 Comparison of Underground Economy Estimates for Five OECD

Source: Schneider and Enste (2000).

It has been empirically found for the monetary approach that the Feige method gives a higher estimate of underground economy than the Gutmann method, which in turn gives a higher estimate than the Tanzi method.

As for the method based on the discrepancy in national accounts, there is a lack of longer series for any country showing the proportion of underground economy based on this method. The reason for this is that the usual practice of statistical offices for national accounts is to harmonise the GDP according to various approaches before publication, resulting from the tendency to have a single published official GDP figure for the reference period.

Already a superficial comparison will lead to the conclusion that the estimated level of underground economy based on the analysis of differences in the national accounts is much lower than the one obtained on the basis of monetary methods. The reason for this is that this method records only the difference between two independent approaches to GDP estimation, where the two approaches do not necessarily have to encompass the entire economic activity, so a part of underground economy can still remain excluded in the application of this method.

.

The determinant/indicators (MIMIC) approach can only give the relative size of underground economy in comparison to a group of countries. In our example, underground economy estimates are in the category of the so called lower conservative estimates of underground economy. The main issue here is the selection of the basic country, because this method measures the relative relationship of underground economy among several countries, but the selection of the basic country is arbitrary. By comparison of results by country, it can be observed that the method of comparison of total expenditures and total income as a rule gives a lower estimated level of underground economy than other methods.

In conclusion, the transaction method generally gives the highest estimation of underground economy, as much as several times higher than the national accounts method. Results obtained by other methods (MIMIC, the input method, the labour force method) are usually somewhere between these limit values.

3.2 Underground Economy in Transition Countries

It is very difficult to find comprehensive and methodologically comparable studies for underground economy in transition countries due to scarcity of available data. Namely, the most frequently used approach in market economies is the monetary approach, which is not suitable for transition countries because of the remonetisation process and the significant deepening of the financial market. Individual indicators of the size and complexity of the legal framework, i.e. the tax (paying) ethics are not available. The system of national accounts is still developing, so that methods based on the use of sources from the income and expenditure side are not methodologically harmonised among countries. Finally, there are two remaining approaches used by various authors for estimation of the size of underground economy in transition countries. The first approach, so called input approach is based on the data on electricity consumption, and the second is the so called Eurostat approach, which is used in the Exhaustiveness programme developed for EU candidate countries.

3.2.1 The Input Method (Electricity Consumption) and Underground Economy in Transition

Although some authors used input data to estimate underground economy even earlier, the application of the electricity method developed relatively late. In order to measure the total economic activity of an economy Kaufmann and Kaliberda (1996), as well as Lacko (1998), postulated that electricity consumption is the best physical indicator. The total (official) economic activity, as well as electricity consumption, are generally known for all countries in the world. The authors assume that the growth of electricity consumption is an indicator describing the movements of the total GDP as well, because short-term elasticity equals 1. They therefore attribute the difference between the total electricity consumption growth rate and the official GDP growth rate to the phenomenon of underground economy.

| Table 2 | Share of U According | nderground Econ to Various Estima | omy in GDP fo ation Methods | or Selected Co | untries |
|-------------------|--------------------------|--|--------------------------------|------------------------|---------|
| Country | Average – all methods | Johnson – Electrical energy input method | DYMIMIC | Kaufmann- Kaliberda | Lacko |
| | | 1994/1995 | 2000/2001 | 1995 | 1998 |
| Bulgaria | 34.5 | 32.7 | 36.4 | - | 34.5 |
| Czech Republic | 16.4 | 14.5 | 18.4 | 12.7 | 19.9 |
| Estonia | 29.9 | 38.5 | 39.1 | 13.4 | 28.7 |
| Croatia | 31.3 | 28.5 | 32.4 | - | 32.9 |
| Latvia | 42.5 | 34.8 | 39.6 | 54.6 | 40.8 |
| Lithuania | 28.7 | 25.2 | 29.4 | 27.6 | 32.5 |
| Hungary | 28.6 | 28.4 | 24.4 | 40.8 | 20.8 |
| Poland | 17.3 | 13.9 | 27.4 | 14.4 | 13.4 |
| Romania | 16.8 | 28.3 | 33.4 | 23.6 | 30.0 |
| Slovakia | 23.0 | 15.2 | 18.3 | - | 17.0 |
| Slovenia | 16.4 | 23.9 | 26.7 | - | 18.4 |
| Average | 26.0 | 24.8 | 28.4 | 27.3 | 24.9 |

Note: Table shows most recent data available.

Source: Lacko (1998) for the Lacko and Kaufmann-Kaliberda method, Schneider (2003) for the Johnson method and DYMIMIC.

Table 2 gives results of estimation of underground economy using the input method. The results clearly justify all objections to this method with regard to the supposed elasticity of electricity consumption, as well as the unchanged energy intensiveness of production.⁴ Applied to transition countries, this method gives highly over-estimated and unreliable data on the size of underground economy and most authors do not consider it satisfactory. Its advantage lies in the availability of data on electricity consumption.

The following chapters deal with the Eurostat approach to measuring underground economy in transition countries, which forms the basis for measurement of underground economy in Croatia within the framework of the Exhaustiveness programme.

3.3 The Eurostat Approach in Measuring Underground Economy – The Exhaustiveness Programme for Transition Countries

3.3.1 The Exhaustiveness Programme – Term and Meaning

In 1996, the Eurostat set about improving the consistency, reliability and coverage of national accounts of the then candidate countries, which today are the new EU member states.⁵ Over the period of ten years, a significant number of projects has been implemented in these countries in order to harmonise the system of national accounts with the ESA 1995 methodology. The primary motive, in addition to increasing the level of harmonisation, was the inclusion of underground economy into official GDP figures. This has significantly changed the obligations and claims of new EU member states with regard to EU funds, increasing their obligations towards the EU, and decreasing their claims from EU funds. This is very important for understanding the context of the Eurostat project, and the effects that the inclusion of underground economy into the official GDP figures will have in the new member states, i.e. candidate countries.

⁴ On this method and its criticism see e.g. Schneidar (2003).

⁵ The new EU member states as of May 2, 2004 are: Cyprus, the Czech Republic, Estonia, Latvia, Lithuania, Hungary, Malta, Poland, Slovakia and Slovenia.

In the field of harmonisation of exhaustiveness of candidate country's national account, as one of the most important target areas, two projects have been implemented. One was implemented in the period 1998-2000, and the other in the period 2002-2003. The first project defined the methodology and standard tables for the so called Tabular Approach for candidate countries, and the other worked out the details of this approach.

3.3.2 Non-exhaustiveness Types in the National Accounts (N1-N7): The Production Approach – A Detailed Description

The classification of non-exhaustiveness types in the national accounts is based on various characteristics of the producer, i.e. the way in which the data are obtained from producers. The classification of non-exhaustiveness types in the national accounts is presented in Figure 1. Regardless of the mutual exclusivity of individual forms, in practice there can also be cases in which individual types of non-exhaustiveness in the national accounts overlap. So, for example, there can be some overlapping between types N1 and N2, as well as between types N1 and N6.

The analysis of individual non-exhaustiveness types aims at insuring a completely exhaustive non-overlapping reporting, which leads towards the ultimate goal of accuracy and exhaustiveness of GDP figures. The analysis of non-exhaustiveness types is not a final aim, and neither is the allocation of individual sources of underground economy of crucial importance. What is important is for countries to follow a consistent set of procedures in order for the obtained data to be directly comparable.

| Figur | e 1 Description of No Accounts (N1 – N | on-Exhaustiveness Types in the National N7) – Sources of Underground Economy |
|-------|--|---|
| N1 | Producer should have registered (underground producer) | Producer fails to register in order to avoid tax & social security obligations. These are often small producers with turnovers which exceed the thresholds above which they should register their income. Producers that fail to register because they are involved in illegal activities that fall under N2, rather than N1. Type N1 does not include all underground activities, some of which are associated with type N6. |

.

| N2 | Illegal producer that fails to register | A A | N2 covers activities of producers that avoid registration entirely. N2 excludes illegal activities by registered legal entities or entrepreneurs that report (or misreport) their activities under legal activity codes. |
|----|---|--------|---|
| N3 | Producer is not obliged to register | AA | Producer is not required to register because it has no market output. Typically, these are non-market household producers involved in: (a) production of goods for own consumption or for own fixed capital formation, and (b) construction of and repairs to dwellings. Producer has some market output but it is below the level at which the producer is expected to register as an entrepreneur. |
| N4 | Registered legal person is not included in statistics | A | The legal person may not be included in the statistics for a variety of reasons. E.g., the business register is out of date or updating procedures are inadequate; the classification data (activity, size or geographic codes) are incorrect; the legal person is excluded from the survey frame because its size is below a certain threshold; etc. |
| N5 | Registered entrepreneur is not included in statistics | AA | A registered entrepreneur may not be included in the statistics for many reasons. E.g., the administrative source with lists of registered entrepreneurs may not always pass on complete or up to date lists to the statistical office. Even if there is a regular flow of accurate and comprehensive information from the administrative source to the statistical office, the registered entrepreneur may not be included in the business register for several reasons (see those given under N4). |
| N6 | Mis-reporting by the producer | A | Mis-reporting invariably means that gross output is under- reported and intermediate consumption is over-reported in order to evade (or reduce) income tax, value added tax or social security contributions. Mis-reporting often involves: the maintenance of two sets of books; payments of <i>envelope salaries</i> which are recorded as intermediate consumption; payments in cash without receipts; and VAT fraud. |
| N7 | Statistical deficiencies in the data | A A A | Type N7 is sub-divided between N7a - data that is incomplete, not collected or not directly collectable, and N7b - data that is incorrectly handled, processed or compiled by statisticians. This distinction is useful because it helps one to better understand the huge variety of possible statistical deficiencies. However, in practice, N7a and N7b cannot always be easily separated. Statistical deficiencies: the following list is not comprehensive but these topics should be investigated for non-exhaustiveness:- • Handling of non-response; • Production for own final use by market producers; • Tips; • Wages & salaries in kind; • Secondary activities. Clearly, not all statistical deficiencies result in the under- estimation of GDP. (The focus here has been to identify and target those areas which are likely to lead to non- exhaustiveness in the NA.) |

3.3.3 Total Size of Underground Economy in Transition Countries According to the Results of Eurostat's Exhaustiveness Programme

Table 3 shows data on the adjustment of exhaustiveness (of underground economy) as a percentage of GDP of new EU member states. All data refer to the year 2000, except for the Czech Republic and Slovenia, for which the reference year is 2002.

| Table 3 | Total A the Ne | Adjustr w EU | ment of E Member | Exhaus States | tiveness , in % | s as a F | Percenta | ge of GI | OP in |
|-------------------|-------------------|-----------------|---------------------|------------------|--------------------|----------|----------|----------|---------|
| Czech Republic | Estonia | Latvia | Lithuania | Malta | Hungary | Poland | Slovakia | Slovenia | Average |
| 2002 | 2000 | 2000 | 2000 | 2000 | 2000 | 2000 | 2000 | 2002 | 2000 |
| 6.8 | 11.2 | 15.1 | 18.9 | 5.8 | 11.9 | 14.7 | 14.8 | 8.1 | 12.1 |

Source: Eurostat.

The average proportion of non-exhaustiveness adjustment of national accounts as a percentage of GDP for the new EU member states was 12.1 percent. Malta and the Czech Republic had the lowest share of adjustments. Slovenia, Estonia and Hungary also had an under-average size of adjustment. The highest adjustments were recorded in two Baltic countries, Lithuania (19 percent) and Latvia (15 percent).

4 Results of Estimation of Total Underground Economy (Unofficial Economy) in Croatia in the Period 1998-2002

The total size of underground economy in Croatia is presented in two ways. The first is a sum of individual types of underground economy according to the Eurostat approach (N1-N7). Since this is a conservative approach, the results obtained by this method can be considered the lower limit value of underground economy which is going to be included into official Croatian GDP. The second option, based on results obtained by other methods (the input method, DYMIMIC method) and the average difference between the results obtained by other methods

and the Eurostat method, gives the upper limit value of underground economy for Croatia.

4.1 Estimated Total Size of Underground Economy in Croatia According to the Eurostat Approach – the Lower Limit Value

In 2005, Croatia started the process of estimation of underground economy according to the Eurostat methodology. The project is implemented in cooperation and with the consultation of experts from the Eurostat and OECD for countries in the so called West Balkans area. Upon completion of the project, expected in course of the year 2007 at the latest, Croatia will include the estimated value of underground economy into its official GDP figures.

The estimation of underground economy in Croatia according to the Eurostat approach is based on:

- The labour force input method (administrative sources and labour force survey);
- Results of tax audit;
- Comparison of indicators of gross production, intermediary consumption and value added per employee for various groups of entrepreneurs, depending on their size and business activity;
- Estimated income from illegal activities (expert analysis);
- Detailed valorisation of statistical sources for GDP calculation and their comparison with alternative sources,⁶ and
- Adjustment of methodology of calculation of imputed dwelling rents in accordance with Eurostat's recommendations.

An estimate of individual forms of underground economy (N1-N7) has also been carried out. The sum of all forms (N1-N7) is the total size of underground economy, i.e. the estimate of the total unofficial economy in Croatia. Tables 4-10

⁶More on estimation method for underground economy in Croatia in Lovrinčević and Mikulić (2005).

| Tab | le 4 Estimation of Activities, in | [•] Size of Un Thousand H | derground IRK | Economy | in Croatia I | by |
|-----|---|---------------------------------------|------------------|------------|--------------|------------|
| Ac | ctivities according to NACE | 1998 | 1999 | 2000 | 2001 | 2002 |
| A | Agriculture, hunting and forestry | 1,165,650 | 1,132,127 | 1,278,390 | 1,146,476 | 1,274,328 |
| В | Fishing | 47,293 | 22,309 | 45,710 | 81,399 | 106,477 |
| С | Mining and quarrying | 24,632 | 26,064 | 24,339 | 29,117 | 34,330 |
| D | Manufacturing | 1,848,512 | 2,933,550 | 3,725,331 | 3,389,270 | 4,100,407 |
| E | Electricity, gas and water supply | 35,709 | 69,101 | 57,051 | 57,347 | 80,580 |
| F | Construction | 1,307,618 | 1,024,286 | 1,497,279 | 1,991,014 | 1,852,528 |
| G | Wholesale and retail trade | 3,573,821 | 3,273,015 | 3,473,635 | 4,197,848 | 3,503,781 |
| Н | Hotels and restaurants | 1,011,792 | 889,395 | 1,247,638 | 1,563,399 | 1,775,336 |
| I | Transport, storage and communication | 1,953,164 | 1,344,103 | 986,275 | 1,064,102 | 1,037,006 |
| J | Financial intermediation | 227,588 | 414,363 | 256,247 | 125,302 | 395,050 |
| к | Real estate, renting and business activities | 2,736,504 | 1,317,304 | 2,220,630 | 2,362,057 | 2,642,839 |
| L | Public administration | 38,588 | 35,684 | 38,573 | 35,991 | 35,221 |
| М | Education | 166,446 | 193,783 | 127,823 | 35,418 | 118,456 |
| Ν | Health and social work | 528,288 | 495,013 | 365,516 | 256,153 | 366,909 |
| 0 | Other community, social and personal service activities | 997,442 | 713,957 | 1,050,197 | 774,721 | 948,964 |
| | Illegal activities | 1,403,558 | 1,444,106 | 1,555,692 | 1,689,523 | 1,829,778 |
| | TOTAL | 17,028,019 | 15,328,161 | 17,950,327 | 18,799,137 | 20,101,991 |

give results of estimation of the total underground economy for the period 1998-2002.

Total underground economy (N1-N7) in Croatia in 2002 amounted to HRK 20.1 billion with illegal activities included, i.e. HRK 18.3 billion without illegal activities (Table 4). With the exception of the year 1999, this amount increased every year. The data for 1998 are based on a labour force survey, which at that time did not encompass the whole territory of Croatia, but was estimated for some parts of the country. This influenced the structure, rather than the total figure of employed persons. Because of this the data on the structure of underground economy for the year 1998 are not entirely reliable, but are still included since the

presented statistical data do not distort the figure for the economy as a whole. Significant changes in the proportion of underground economy, for example in the manufacturing sector (a share of 11.8 percent in 1998 which increased to 21.1 percent in 1999), are therefore more a consequence of more exhaustive statistical coverage than a real change

| Table | of Croatia (Without | Illegal Activi | ivities - N | ar underg 2), in % | ground Ed | conomy |
|-------|---|----------------|-------------|-----------------------|-----------|--------|
| Ac | tivities according to NACE | 1998 | 1999 | 2000 | 2001 | 2002 |
| A | Agriculture, hunting and forestry | 7.4 | 8.2 | 7.8 | 6.7 | 7.0 |
| В | Fishing | 0.3 | 0.2 | 0.3 | 0.5 | 0.6 |
| С | Mining and quarrying | 0.2 | 0.2 | 0.1 | 0.2 | 0.2 |
| D | Manufacturing | 11.8 | 21.1 | 22.7 | 19.8 | 22.4 |
| E | Electricity, gas and water supply | 0.2 | 0.5 | 0.3 | 0.3 | 0.4 |
| F | Construction | 8.3 | 7.4 | 9.1 | 11.6 | 10.1 |
| G | Wholesale and retail trade | 22.8 | 23.6 | 21.2 | 24.5 | 19.2 |
| н | Hotels and restaurants | 6.5 | 6.4 | 7.6 | 9.1 | 9.7 |
| I | Transport, storage and communication | 12.5 | 9.7 | 6.0 | 6.2 | 5.7 |
| J | Financial intermediation | 1.5 | 3.0 | 1.6 | 0.7 | 2.2 |
| к | Real estate, renting and business activities | 17.5 | 9.5 | 13.5 | 13.8 | 14.5 |
| L | Public administration | 0.2 | 0.3 | 0.2 | 0.2 | 0.2 |
| М | Education | 1.1 | 1.4 | 0.8 | 0.2 | 0.6 |
| N | Health and social work | 3.4 | 3.6 | 2.2 | 1.5 | 2.0 |
| 0 | Other community, social and personal service activities | 6.4 | 5.1 | 6.4 | 4.5 | 5.2 |
| | TOTAL | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Table 5. Preparties of Individual Activities in Total Underground Economy

A major part of underground economy in 2002 consisted of underground economy in the manufacturing sector (HRK 4.1 billion, i.e. 22.4 percent, Table 5), followed by wholesale and retail trade, which decreased slightly in its proportion in underground economy - from HRK 3.6 billion (22.8 percent of underground economy) in 1998, to HRK 3.5 billion, or 19.2 percent of total underground economy. A decrease in underground economy was also recorded in transportation, real-estate and business activities, public administration, health work, education and personal service activities. For all other activities the value of

underground economy increased in the period 1998-2002, measured in current prices.

The average proportion of underground economy in total gross value added (GVA) of the Croatian economy in the observed period is declining. From the initial 15.4 percent of GVA (12.4 percent of GDP) in 1998, it decreased to 13.9 percent of GVA (11.2 percent of GDP) in 2002 (Table 6). If illegal activities are excluded from the total figure, the proportion of underground economy in GDP in 1998 is over 11.4 percent, i.e. 10.2 percent in 2002.

| Table | e 6 Proportion of Underg Total GDP, in % | round Eco | onomy of | Individua | I Activit | ies in |
|-------|--|-----------|----------|-----------|-----------|--------|
| A | Activities according to NACE | 1998 | 1999 | 2000 | 2001 | 2002 |
| Α | Agriculture, hunting and forestry | 10.9 | 10.1 | 11.7 | 9.4 | 10.1 |
| В | Fishing | 19.8 | 7.7 | 15.8 | 28.6 | 26.7 |
| С | Mining and quarrying | 3.8 | 4.3 | 2.9 | 3.1 | 2.9 |
| D | Manufacturing | 7.5 | 12.0 | 13.9 | 11.7 | 13.8 |
| E | Electricity, gas and water supply | 0.9 | 1.6 | 1.5 | 1.5 | 1.9 |
| F | Construction | 16.9 | 16.1 | 25.5 | 29.1 | 21.7 |
| G | Wholesale and retail trade | 25.9 | 27.5 | 26.4 | 26.3 | 19.1 |
| Н | Hotels and restaurants | 28.3 | 24.6 | 29.6 | 32.8 | 33.7 |
| I | Transport, storage and communication | 20.0 | 13.0 | 7.9 | 7.7 | 6.6 |
| J | Financial intermediation | 4.6 | 7.3 | 4.5 | 1.9 | 4.8 |
| к | Real estate, renting and business activities | 49.3 | 23.0 | 35.3 | 32.8 | 31.7 |
| L | Public administration | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 |
| М | Education | 3.4 | 3.4 | 2.0 | 0.5 | 1.7 |
| Ν | Health and social work | 9.3 | 7.4 | 5.1 | 3.5 | 4.8 |
| 0 | Other service activities | 37.1 | 20.6 | 28.0 | 18.0 | 19.9 |
| | TOTAL, including N2 (as % of GVA) | 15.4 | 13.5 | 14.9 | 14.3 | 13.9 |
| | TOTAL, including N2 (as % of GDP) | 12.4 | 10.8 | 11.8 | 11.3 | 11.2 |
| | TOTAL, without N2 (as % of GDP) | 11.4 | 9.8 | 10.7 | 10.3 | 10.2 |

Activities with the highest share in underground economy in GVA in 2002 are:

- Hotels and restaurants (33.7 percent),
- Real estate, renting and business activities (31.7 percent),
- Fishing (26.7 percent),
- Construction (21.7 percent),
- Other service activities (19.9 percent) and
- Trade (19.1 percent).

It should be highlighted that activities whose share of underground economy in GVA increased are: hotels and restaurants, fishing, construction, manufacturing and electricity, gas and water supply.

Below are results broken down according to types of underground economy. The total size of underground economy in Croatia in 2002 was HRK 20.1 billion, representing a growth of 18 percent compared to 1998 (Table 7). The most important type of underground economy is N6 – misreporting by the producer – amounting to HRK 9.0 billion. The next most important type is N1 – non-registered (underground) producers (HRK 5.6 billion), followed by N7 – statistical deficiencies in the data (HRK 2.7 billion). It is obvious that N6 (misreporting by the producer) is the type with the largest increase in underground economy, while type N1 (non-registered/underground producers) is on the decrease. This is an indication of underground economy moving in the direction of misreporting, i.e. into the jurisdiction of tax authorities, whereas non-registered (underground) producers are decreasing with growing of market institutions and penalties/fines. In other words, tax evasion methods are growing more sophisticated.

In terms of proportion of individual types in underground economy, type N6 – misreporting – participated with 44.8 percent in total underground economy in 2002. There follow N1 with 28.0 percent and N7 with 13.5 percent (Table 8). This is an indication for tax authorities to focus their efforts on misreporting by producers, i.e. under-reporting of income and over-reporting of costs, as well as fictitious minimum salary reporting. On the other hand, there is also significant

room for improvement of statistical exhaustiveness to include data still amounting to as much as 13.5 percent of total underground economy in Croatia.

| Tabl | e 7 Underground HRK | Economy i | n Croatia b | y Type (N1 | -N7), in The | ousand |
|------|---|------------|-------------|------------|--------------|------------|
| יד | /pe of underground economy | 1998 | 1999 | 2000 | 2001 | 2002 |
| N1 | Non-registered (underground) producers | 7,701,002 | 6,988,430 | 6,538,261 | 6,013,777 | 5,636,012 |
| N2 | Non-registered illegal producers | 1,403,558 | 1,444,106 | 1,555,692 | 1,689,523 | 1,829,778 |
| N3 | Producer is not obliged to register | 117,571 | 114,429 | 180,508 | 259,448 | 291,366 |
| N4 | Registered legal person is not included in statistics | | | | | |
| N5 | Registered entrepreneur is not included in statistics | 380,200 | 421,200 | 476,714 | 523,548 | 631,730 |
| N6 | Mis-reporting by the producer | 4,863,038 | 4,375,293 | 6,447,203 | 7,532,944 | 9,007,633 |
| N7 | Statistical deficiencies in the data | 2,601,238 | 1,984,703 | 2,751,949 | 2,779,896 | 2,705,473 |
| | TOTAL | 17,028,019 | 15,328,161 | 17,950,327 | 18,799,137 | 20,101,991 |

| Tabl | e 8 Proportion of Individual Underground Economy in | Types of n Croatia, | Undergro , in % | ound Eco | onomy ir | n Total |
|------|--|------------------------|--------------------|----------|----------|---------|
| | Type of underground economy | 1998 | 1999 | 2000 | 2001 | 2002 |
| N1 | Non-registered (underground) producers | 45.2 | 45.6 | 36.4 | 32.0 | 28.0 |
| N2 | Non-registered illegal producers | 8.2 | 9.4 | 8.7 | 9.0 | 9.1 |
| N3 | Producer is not obliged to register | 0.7 | 0.7 | 1.0 | 1.4 | 1.4 |
| N4 | Registered legal person is not included in statistics | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| N5 | Registered entrepreneur is not included in statistics | 2.2 | 2.7 | 2.7 | 2.8 | 3.1 |
| N6 | Mis-reporting by the producer | 28.5 | 28.5 | 35.9 | 40.1 | 44.8 |
| N7 | Statistical deficiencies in the data | 15.2 | 12.9 | 15.3 | 14.8 | 13.5 |
| | TOTAL | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Table 9 shows the proportion of individual types of underground economy in GVA. At the national level this proportion decreased from 15.4 percent in 1998 to 13.9 percent in 2002.

| Table | $e \ 9$ Share of Individual Types of | of Underg | ground E | conomy | y in GV/ | A, in % |
|-------|---|-----------|----------|--------|----------|----------------|
| | Type of underground economy | 1998 | 1999 | 2000 | 2001 | 2002 |
| N1 | Non-registered (underground) producers | 7.0 | 6.2 | 5.4 | 4.6 | 3.9 |
| N2 | Non-registered illegal producers | 1.3 | 1.3 | 1.3 | 1.3 | 1.3 |
| N3 | Producer is not obliged to register | 0.1 | 0.1 | 0.1 | 0.2 | 0.2 |
| N4 | Registered legal person is not included in statistics | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| N5 | Registered entrepreneur is not included in statistics | 0.3 | 0.4 | 0.4 | 0.4 | 0.4 |
| N6 | Mis-reporting by the producer | 4.4 | 3.9 | 5.3 | 5.7 | 6.3 |
| N7 | Statistical deficiencies in the data | 2.4 | 1.7 | 2.3 | 2.1 | 1.9 |
| | TOTAL | 15.4 | 13.5 | 14.9 | 14.3 | 13.9 |

In addition to the above types of underground economy, the official GDP in Croatia is under-estimated also with regard to the calculation of the imputed dwelling rents. This refers to the Eurostat request that the calculation of the imputed dwelling rents should also include the imputed net operating surplus, which is not included in the existing methodology of calculation in Croatia.⁷ The alternative method for calculating the value of dwelling rents, the so called cost method recommended by the Eurostat for countries with less than 10 percent of the total dwelling stock on the renting market, gives the amount of correction for the present value of dwelling rents in GDP. The present value of imputed dwelling rents, under the assumption of net operating surplus of 2 percent of the value of total dwelling stock, must be corrected by between HRK 6.4 billion in 1998 and HRK 8.2 billion in 2002. With the new alternative calculation of dwelling rents, the participation of dwelling rents after inclusion of underground economy into the GDP comes to between 8.6 percent in 1998 and 8.9 percent in 2002. This indicates that relative prices of real estate grew faster than the general GDP deflator, which places Croatia among other EU countries and countries in transition. However, it must be noted here that this is still a conservative estimate,

⁷ More in Lovrinčević and Mikulić (2005).

because most new EU member states use the estimated operating surplus of 2.5 percent, instead of 2 percent of the total value of the dwelling stock used in this calculation.

Table 10 shows the necessary total corrections of Croatian GDP (lower limit value of estimation), and the analysis by type of underground economy. After the inclusion of underground economy into official GDP figures, new total GDP values should be as follows: 161.0 billion HRK in 1998, 163.8 billion HRK in 1999, 177.8 billion HRK in 2000, 192.4 billion HRK in 2001, and 209.6 billion HRK in 2002.

- 12.4 percent without changing the methodology of calculation of dwelling rents, i.e. 17.0 percent including the change in calculation of the dwelling rents (in 1998),
- 10.8 percent without changing the methodology of calculation of dwelling rents, i.e. 15.7 percent including the change in the calculation of dwelling rents (in 1999),
- 11.8 percent without changing the methodology of calculation of dwelling rents, i.e. 16.6 including the change in the calculation of dwelling rents (in 2000),
- 11.3 percent without changing the methodology of calculation of dwelling rents, i.e. 16.1 percent including the change in the calculation of dwelling rents (in 2001),
- 11.1 percent without changing the methodology of calculation of dwelling rents, i.e. 15.6 percent including the change in the calculation of dwelling rents (in 2002).

| Table 10 Total Corrections of GDP due to Inclu Rents, Lower Limit Value of Estimatio | sion of Undergrc n, Current Price | ound Economy s in Thousand | and Change in (HRK | alculation of the | e Dwelling |
|--|--------------------------------------|-------------------------------|------------------------|-------------------|-------------|
| | 1998 | 1999 | 2000 | 2001 | 2002 |
| Official GDP | 137,603,708 | 141,579,068 | 152,518,827 | 165,639,462 | 181,231,000 |
| Underground economy (N1-N7) | 17,028,019 | 15,328,161 | 17,950,327 | 18,799,137 | 20,101,991 |
| Methodology changes in calculation of dwelling rents | 6,390,756 | 6,862,893 | 7,359,173 | 7,918,378 | 8,241,756 |
| Total corrections | 23,418,775 | 22,191,054 | 25,309,500 | 26,717,515 | 28,343,747 |
| Total corrected GDP | 161,022,483 | 163,770,122 | 177,828,327 | 192,356,977 | 209,574,747 |
| Share of corrections (N1-N7), in % | 12.4 | 10.8 | 11.8 | 11.3 | 11.1 |
| Share of total corrections including the dwelling rents, in % | 17.0 | 15.7 | 16.6 | 16.1 | 15.6 |

4.2 Total Underground Economy in Croatia Compared to Average of Other Methods – Upper Estimated Limit Value

The upper limit value of underground economy in Croatia is based on results obtained by application of other methods. In estimation of the upper limit value of underground economy, a comparison with estimated values of underground economy for the new member states is used. It is necessary to establish a ratio between average results obtained by all other methods (Table 2) and the conservative approach based on the Eurostat approach. The results are shown in Table 11.

| Table 11 Comparison Between Estimated Values of Underground Economy Based on the Eurostat Approach and Other Methods | | | | | | | |
|--|-------------------------|------------------------------------|-----------------------------------|--|--|--|--|
| Country/Method | Eurostat method 2000 | Average of other methods (Table 2) | Ratio other methods / Eurostat | | | | |
| Czech Republic | 6.8* | 16.4 | 2.4 | | | | |
| Estonia | 11.2 | 29.9 | 2.7 | | | | |
| Latvia | 15.1 | 42.5 | 2.8 | | | | |
| Lithuania | 18.9 | 28.7 | 1.5 | | | | |
| Malta | 5.8 | n.a. | n.a. | | | | |
| Hungary | 11.9 | 28.6 | 2.4 | | | | |
| Poland | 14.7 | 17.3 | 1.2 | | | | |
| Slovakia | 14.8 | 16.8 | 1.1 | | | | |
| Slovenia | 8.1* | 23.0 | 2.8 | | | | |
| Average | 12.1 | 26.0 | 2.15 | | | | |
| Croatia | 15.8* | 34.0 | 2.15 | | | | |

* Data for 2002. Source: Eurostat (2004).

Table 11 shows that the average size of underground economy according to the Eurostat approach was 12.1 percent for the group of new EU member states. The average result of all other methods (electricity input, DYMIMIC) was 2.15 times higher than the results obtained by the Eurostat method. If we multiply the estimated underground economy figures for Croatia obtained by the Eurostat method (15.6 percent of GDP) with the average ratio for the other countries (2.15) we get the estimated upper limit value of underground economy in Croatia (33.6 percent of GDP) for 2002 (Table 12).

| Table 12 Total Corrections of GDP due to Inclusion Current Prices in Thousand HRK | n of Undergroun | d Economy, Lo | ower and Upper | Limit Value of | Estimation, |
|---|-----------------|---------------|----------------|----------------|-------------|
| | 1998 | 1999 | 2000 | 2001 | 2002 |
| Official GDP | 137,603,708 | 141,579,068 | 152,518,827 | 165,639,462 | 181,231,000 |
| Total underground economy (lower limit value) | 23,418,775 | 22,191,054 | 25,309,500 | 26,717,515 | 28,343,747 |
| Total underground economy (upper limit value) | 50,265,156 | 47,762,459 | 54,402,583 | 57,303,040 | 60,903,646 |
| Total corrected GDP (lower limit value) | 161,022,483 | 163,770,122 | 177,828,327 | 192,356,977 | 209,574,747 |
| Total corrected GDP (upper limit value) | 187,868,864 | 189,341,527 | 206,921,410 | 222,942,502 | 242,134,646 |
| Share of underground economy in GDP (lower limit value), in % | 17.0 | 15.7 | 16.6 | 16.1 | 15.6 |
| Share of underground economy in GDP (upper limit value), in % | 36.5 | 33.7 | 35.7 | 34.6 | 33.6 |

The Impact of Inclusion of Underground Economy on Basic Macroeconomic Indicators in Croatia

This chapter shows what the basic macroeconomic indicators would be like if Croatia's GDP was corrected by the estimated size of underground economy. The Eurostat approach was used as the lower estimated limit value for correction of the Croatian GDP in near future. All types of underground economy are included (N1-N7), as well as a methodological correction of calculation of imputed dwelling rents.

A comparison has been made with transition countries which became full EU members in 2004 and with the remaining candidate countries (Bulgaria and Romania). The period encompassed is 1999 to 2003, in which all the above countries included estimated values of underground economy from the Exhaustiveness programme into their official GDP figures. Figures for Croatia are presented both with the official GDP figures and with the correction for the size of underground economy. The estimated value of underground economy for the period 1998-2002 is presented in the previous chapter, whereas the year 2003 is estimated on the basis of results from the previous period. Since 2003 had a faster growth of activities with a significant share in underground economy, a slight increase of the total proportion of underground economy can be expected in this year.

5.1 Croatia's Level of Development Measured by per Capita GDP

Per capita GDP is usually used as the overall development indicator of a country. At the EU level, a better comparison of levels of development has been ensured through the project of comparison of purchase power, since here GDP is corrected by the difference in price levels.

Table 13 shows that according to the official per capita GDP, measured according to the purchasing power parity, in 2003 Croatia lagged behind all other transition

countries which acceded the EU in 2004 except for Latvia, Lithuania and Poland, while Bulgaria and Romania were significantly behind Croatia and other analysed countries

If underground economy is included into the official GDP figures, as has been done for other candidate countries, according to this indicator Croatia would be economically more developed than Estonia and Slovakia, while Slovenia, the Czech Republic and Hungary would still be ahead. However, on the other side, the inclusion of underground economy does not significantly change the growth of per capita GDP measured according to purchasing power parity in the period 1999-2003. Namely, the total per capita GDP (with underground economy included) has in this period grown only 0.2 percent faster than the official GDP figures. According to the indicator of the average growth rate of per capita GDP, measured according to purchasing power parity, Croatia is still placed in the middle of the group of analysed countries. The highest cumulative growth has been recorded in the Baltic countries, Hungary, Bulgaria and Romania.

| Table 13 Per Capita GDP According to Purchasing Power Parity, in Current EUR | | | | | | | |
|---|--------|--------|--------|--------|--------|--------------------|--------------------|
| | 1999 | 2000 | 2001 | 2002 | 2003 | Index 2003/1999 | Index EU-25=100 |
| Czech Republic | 12,139 | 12,761 | 13,474 | 14,258 | 14,661 | 120.8 | 68.3 |
| Hungary | 9,707 | 10,507 | 11,501 | 12,349 | 12,768 | 131.5 | 59.5 |
| Poland | 8,432 | 9,014 | 9,251 | 9,622 | 9,801 | 116.2 | 45.7 |
| Slovakia | 8,717 | 9,428 | 10,010 | 10,836 | 11,139 | 127.8 | 51.9 |
| Slovenia | 13,649 | 14,409 | 15,230 | 15,868 | 16,339 | 119.7 | 76.2 |
| Estonia | 7,616 | 8,568 | 9,138 | 9,848 | 10,337 | 135.7 | 48.2 |
| Latvia | 6,325 | 6,981 | 7,626 | 8,216 | 8,721 | 137.9 | 40.6 |
| Lithuania | 6,961 | 7,581 | 8,305 | 8,939 | 9,744 | 140.0 | 45.4 |
| Bulgaria | 4,881 | 5,305 | 5,821 | 6,073 | 6,341 | 129.9 | 29.6 |
| Romania | 4,745 | 4,987 | 5,440 | 6,041 | 6,332 | 133.4 | 29.5 |
| Croatia | 7,425 | 8,081 | 8,602 | 9,350 | 9,951 | 134.0 | 46.4 |
| Croatia (underground economy included) | 8,591 | 9,422 | 9,987 | 10,827 | 11,532 | 134.2 | 53.8 |

| ole 13 | Per Capita GDP According to Purchasing Power Parity, i | n |
|--------|--|---|
| | | |

Source: WIIW, Eurostat.

.

Per capita GDP measured according to purchasing power parity based on data for formal economy would in 2003 amount to about 46.4 percent of the average GDP for all EU countries (Table 14). This is below the level of transition countries which acceded the EU in 2004 (NMS-8) by about 8 percentage points. However, with the correction for underground economy this gap would be significantly reduced and show a more realistic level of development of Croatian economy.

5.2 Indicators of the State of Public Finances in Croatia

Table 14 shows general government income and expenditure. According to official data, the proportion of general government expenditure in 2003 in Croatia (48.2 percent of GDP) is higher than the average for transition countries which became the new EU member states (44.7 percent of GDP in NMS-8⁸). This is a very heterogeneous indicator for the above group of countries, ranging between 34.1 for Lithuania and 53.2 for the Czech Republic. However, with the inclusion of underground economy in Croatia, the proportion of general government expenditure in GDP decreases to 41.5 percent, which is below the NMS-8 average. On the other hand, general government income, which exceeds the average for the group of analysed countries (43.7 percent in Croatia compared to 40.9 percent for the NMS-8 group), decreases to 37.7 percent of GDP with the inclusion of underground economy, which is, with the exception of Lithuania and Latvia, lower than the level of the new EU member states. With all these new moments, the real challenge for public finances in Croatia - even more than the need to reduce the proportion of public consumption - becomes the improvement of the structure of public consumption within the predefined proportion of government expenditure in GDP on one hand, i.e. a more efficient collection of taxes and other state income on the other.

⁸ NMS-8: the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia, Slovenia

| Transition Countries in | 2003 | | |
|--|--|---|--|
| Country | GDP in EUR, purchasing power parity per capita EU-25=100 | General government expenditure as % of GDP | General government income as % of GDP |
| Czech Republic | 68.3 | 53.2 | 41.6 |
| Estonia | 48.2 | 35.7 | 38.9 |
| Hungary | 59.5 | 50.7 | 44.5 |
| Latvia | 40.6 | 36.0 | 34.5 |
| Lithuania | 45.4 | 34.1 | 32.3 |
| Poland | 45.7 | 48.7 | 44.3 |
| Slovakia | 51.9 | 50.8 | 45.2 |
| Slovenia | 76.2 | 48.2 | 46.2 |
| NMS-8 ¹⁾ | 54.5 | 44.7 | 40.9 |
| EU-15 | 109.2 | 48.4 | 45.8 |
| EU-25 ¹⁾ | 100.0 | 46.3 | 44.6 |
| Croatia | 46.4 | 48.2 | 43.7 |
| Croatia (underground economy included) | 53.8 | 41.5 | 37.7 |

Table 14 General Government Income and Expenditure in Selected

Source: WIIW, Eurostat.

Regarding the impact of inclusion of underground economy on the size of general government deficit (Table 15), it can be seen that it decreases from 6.1 percent to 5.3 percent of GDP in 2003, but the position of Croatia is not changed in relation to other countries. Namely, after the Czech Republic and Hungary, Croatia is still the country with the highest share of general government deficit in GDP.

A high level of general government deficit has culminated in the course of years, coming to 50.3 percent proportion of public debt in GDP in 2003, i.e. 43.4 percent after the inclusion of underground economy (Table 16). The inclusion of underground economy moves Croatian public finances further away from the upper limit value defined by the Maastricht criteria (60 percent of GDP), but does not significantly change Croatia's relative position. Namely, after Hungary, Poland and Bulgaria, Croatia is still the country with the highest percentage of public debt in GDP, although significantly below 60 percent.

| Table 15 General Government Deficit/Sufficit, as % of GDP | | | | | | | |
|---|------|-------|------|------|-------|--|--|
| Country | 1999 | 2000 | 2001 | 2002 | 2003 | | |
| Czech Republic | -3.7 | -3.7 | -5.9 | -6.7 | -11.6 | | |
| Hungary | | -2.3 | -3.7 | -8.5 | -6.2 | | |
| Poland | -1.9 | -1.6 | -3.9 | -3.6 | -4.5 | | |
| Slovakia | -7.1 | -12.3 | -6.0 | -5.7 | -3.7 | | |
| Slovenia | | -3.5 | -2.7 | -2.3 | -2.0 | | |
| Estonia | -3.7 | -0.6 | 0.3 | 1.3 | 3.1 | | |
| Latvia | -4.9 | -2.7 | -2.1 | -2.7 | -1.5 | | |
| Lithuania | -5.5 | -2.5 | -2.0 | -1.5 | -1.9 | | |
| Bulgaria | -0.9 | -0.6 | -0.6 | -0.7 | 0.0 | | |
| Romania | | -4.0 | -3.2 | -2.5 | -2.3 | | |
| Croatia | -8.2 | -6.5 | -6.8 | -4.8 | -6.1 | | |
| Croatia (underground economy included) | -7.1 | -5.6 | -5.9 | -4.1 | -5.3 | | |

Source: WIIW, IFS.

| Table 16 Public Debt, as % of GDP | | | | | | |
|--|------|------|------|------|------|--|
| Country | 1999 | 2000 | 2001 | 2002 | 2003 | |
| Czech Republic | 14.0 | 18.2 | 27.2 | 30.7 | 38.3 | |
| Hungary | 61.2 | 55.4 | 52.2 | 55.5 | 56.9 | |
| Poland | 40.3 | 36.8 | 36.7 | 41.2 | 45.4 | |
| Slovakia | 43.8 | 49.9 | 48.7 | 43.3 | 42.6 | |
| Slovenia | 25.1 | 27.4 | 28.1 | 29.5 | 29.4 | |
| Estonia | 6.5 | 4.7 | 4.4 | 5.3 | 5.3 | |
| Latvia | 13.7 | 12.9 | 14.9 | 14.1 | 14.4 | |
| Lithuania | 23.4 | 23.8 | 22.9 | 22.4 | 21.4 | |
| Bulgaria | 79.3 | 73.6 | 66.2 | 53.2 | 46.2 | |
| Romania | 24.0 | 23.9 | 23.2 | 23.3 | 21.3 | |
| Croatia | 47.2 | 48.9 | 50.3 | 49.9 | 50.3 | |
| Croatia (underground economy included) | 40.8 | 41.9 | 43.3 | 43.1 | 43.4 | |

Source: WIIW, IFS.

5.3 Influence on Balance of Payments and Foreign Debt Indicators

After the inclusion of underground economy, the proportion of foreign debt as a percentage of GDP in Croatia decreased from 75.5 percent to 65.2 percent (Table 17) in 2003. Even after the inclusion of underground economy, along with Hungary, Croatia is still the country with the largest proportion of foreign debt in GDP, which has a significant influence on the credit rating of country.

| Table 17 Foreign Debt, as % of GDP | | | | | | | |
|--|------|------|------|------|------|--|--|
| Country | 1999 | 2000 | 2001 | 2002 | 2003 | | |
| Czech Republic | 41.6 | 42.0 | 39.1 | 37.8 | 38.3 | | |
| Hungary | 60.8 | 64.8 | 64.0 | 61.4 | 67.1 | | |
| Poland | 42.2 | 44.1 | 39.2 | 43.5 | 50.0 | | |
| Slovakia | 52.1 | 54.9 | 54.0 | 55.7 | 51.2 | | |
| Slovenia | 26.9 | 32.8 | 34.4 | 40.0 | 58.3 | | |
| Bulgaria | 84.3 | 88.9 | 78.1 | 70.3 | 63.1 | | |
| Romania | 24.6 | 27.8 | 29.7 | 33.3 | 33.6 | | |
| Croatia | 54.1 | 60.6 | 60.7 | 61.6 | 75.5 | | |
| Croatia (underground economy included) | 46.8 | 52.0 | 52.3 | 53.2 | 65.2 | | |

Source: WIIW, IFS.

5.4 The Maastricht Criteria and the Inclusion of Underground Economy in Croatia

Finally, Table 18 shows the influence of inclusion of underground economy on basic macroeconomic indicators relating to the Maastricht criteria. It can be seen that general government proportion in GDP has decreased from -6.1 percent to - 5.3 percent, and of public debt from 50.3 to 43.4 percent of GDP. However, the inclusion of underground economy has no effect on the remaining two indicators – inflation and long-term interest rates.

| Table 18 Maastricht Criteria in the New EU Member States and Candidate Countries, 2003 | | | | | | | |
|---|--|--------------------------------------|--|--|--|--|--|
| Country, group of countries | General government deficit, in % of GDP, 2003 | Public debt, in % of GDP, 2003 | Inflation | Long-term interest rates | | | |
| Croatia | -6.1 | 50.3 | 1.8 | 5 approximately* | | | |
| Croatia (underground economy included) | -5.3 | 43.4 | 1.8 | 5 approximately* | | | |
| Maastricht criteria | -3.0 | 60 | 2.6 (average of 3 EU member states with lowest inflation + 1.5 percentage point) | 6.13 (long-term interest rates average of 3 EU member states with lowest inflation rate + 2 percentage points) | | | |
| New EU member states and candidate countries fulfilling all criteria | | | | | | | |
| Estonia | + 3.1 | 5.3 | 1.1 | 4.9 | | | |
| Lithuania | - 1.9 | 21.4 | -0.9 | 5.2 | | | |
| Countries fulfilling three of the criteria | | | | | | | |
| Slovenia | -2.0 | 29.4 | 5.2 | 6.1 | | | |
| Latvia | -1.5 | 14.4 | 3.3 | 5.0 | | | |
| Czech Republic | -11.6 | 38.3 | 0.4 | 4.2 | | | |
| Poland | -4.5 | 45.4 | 0.9 | 6.0 | | | |
| Croatia | -6.1 | 50.3 | 1.8 | 5 approximately* | | | |
| Croatia (underground economy included) | -5.3 | 43.4 | 1.8 | 5 approximately* | | | |
| Countries fulfilling only two of the criteria | | | | | | | |
| Malta | -9.7 | 72.0 | 2.1 | 4.9 | | | |
| Slovakia | -3.7 | 42.6 | 8.6 | 5.0 | | | |
| Countries fulfilling only one criterion | | | | | | | |
| Hungary | -6.2 | 56.9 | 5.0 | 7.2 | | | |
| Cyprus | -6.3 | 72.2 | 3.4 | 4.7 | | | |

Note: Bold figures indicate fulfilment of the convergence criterion.

Source: WIW based on European Commission estimates, Spring 2004. "Economic Forecasts, European Commission", p. 134. * not entirely compatible with the Maastricht criterion of reference long-term interest rate (more at http://europa.eu.int/comm/eurostat/newcronos/reference/sdds).

Taking the whole picture into consideration, even after the inclusion of underground economy into the official GPD figures, in 2003 Croatia still fulfils three out of four Maastricht criteria. Still unfulfilled is the criterion of general government deficit as percentage of GDP, where the threshold is 3 percent of GDP, whereas Croatia had -5.3 percent of GDP in 2003 with underground economy included. Therefore, in the coming period Croatia has to continue consolidating its public finances. However, the inclusion of underground economy into official Croatian GDP figures influences the speed of fulfilment of the remaining Maastricht criterion.

5.5 Conclusion on the Size of Underground Economy in Croatia and the Influence on Macroeconomic Indicators

The EU has introduced an explicit obligation for all member states to include into their official GDP data an estimate of underground economy resulting from statistical or economic reasons. For this purpose, the Eurostat Exhaustiveness programme has been developed for a group of candidate countries, ten of which became full EU member states as of May 1, 2004. According to this programme, new EU member states must include a correction for the value of the underground economy into their official GDP figures. The average correction of official GDP figures for the year 2000 was 12.1 percent of GDP, ranging from 5.8 percent (Malta) to 18.9 percent (Lithuania). Croatia was not included in the Exhaustiveness programme, so its official GDP data currently do not include underground economy and are consequently not entirely comparable with the data for the new EU member states.

Results of estimation of underground economy obtained by other methods are less reliable, due to limited availability of data. Namely, the most frequently used approach in market economies is the monetary approach, which is not suitable for transition countries because of the processes of remonetisation and the significant deepening of financial market in transition countries. Individual indicators of the size and complexity of the legal framework, i.e. the tax ethics are not available. The system of national accounts is still developing, so all methods relying on the use of

various income and expenditure sources are not methodologically coordinated among countries. Finally, two remaining approaches are used by various authors for determining the size of underground economy in transition countries. The first is based on the so called *input approach*, where data on electricity consumption are used as indicator, and the second is the Eurostat approach, used in the Exhaustiveness programme for candidate countries.

The Eurostat method for estimating the size of underground economy is the most conservative of all methods and always gives the lower limit value of estimated underground economy. Estimates of underground economy obtained by other methods (the input method, econometric points) are in average 2.15 times higher (Table 11) than the Eurostat method.

This paper gives an estimate of underground economy for the period 1998-2002 based on the Eurostat approach. According to this estimate, underground economy (including a correction of calculation method of the imputed dwelling rents) in Croatia amounts to between 15.7 percent (1999) and 17.0 percent (1998). On the basis of data regarding the changes of the structure of GDP in 2003, showing a growth of service sector activities which have a higher proportion of underground economy in GDP has grown slightly and that in 2003 it amounted to 15.6 percent of GDP. This means that the upper limit value of estimated underground economy for Croatia obtained by other methods would amount to 33.6 percent of GDP for 2003.

Table 19 shows the influence of the official Croatian GDP figure corrected by the estimated amount of underground economy based on the Eurostat method on basic macroeconomic indicators.

.

| GDP and GDP Including the Estimated Underground Economy Based on the Eurostat Approach | | | | | | | |
|---|---------|--|--|--|--|--|--|
| | Croatia | Croatia (underground economy included) | | | | | |
| GDP per capita, euro, PPP | 9,951 | 11,532 | | | | | |
| GDP per capita PPP, EU-25=100 | 46.4 | 53.8 | | | | | |
| Public sector expenditure, in % of GDP | 48.2 | 41.5 | | | | | |
| Public sector income, in % of GDP | 43.7 | 37.7 | | | | | |
| Public sector deficit, in % of GDP | -6.1 | -5.3 | | | | | |
| Public debt, in % of GDP | 50.3 | 43.4 | | | | | |
| Foreign debt, in % of GDP | 75.5 | 65.2 | | | | | |

Table 19 Comparison of Basic Macroeconomic Indicators Using Official

With the inclusion of underground economy Croatia would reduce the gap in per capita GDP measured according to the purchasing power parity. The new figure would be 53.8 percent of the EU-25 average measured in per capita GDP according to purchasing power parity, whereas according to official data it amounted to 46.4 percent. The proportion of total consolidated government expenditure would also decrease from 48.2 to 41.5 percent, which would place Croatia below the NMS-8 average of 44.7 percent, discrediting also to a certain extent the thesis on the high level of government sector expenditures in Croatia.

However, regarding the proportion of public debt in GDP, even after the inclusion of underground economy Croatia is still in a much less favourable position than the majority of NMS-8. A similar conclusion can be made for the balance-of-payments deficit and the share of external debt in GDP.

In terms of the Maastricht convergence criteria, the underground economy inclusion procedure does not affect the fact that the criteria are not met. Namely, the inclusion of the underground economy influences two indicators: proportion of the state sector deficit in GDP and the proportion of the public debt in GDP. The inclusion of the underground economy does not help fulfilling the criterion concerning the government sector deficit. The criterion concerning the size of public debt is fulfilled by Croatia even without the inclusion of underground economy. On the other hand, the criterion of inflation and the size of long-term interest rates are not directly linked to the GDP value.

Literature

Adam, Marcus C. and Victor Ginsburgh, 1985, "The effects of irregular markets on macroeconomic policy: Some estimates for Belgium", *European Economic Review*, 29(1), pp. 15-33.

Asea, Patrick K., 1996, "The Informal Sector: Baby or Bath Water?", Carnegie-Rochester Conference Series on Public Policy, 45, pp. 163-171.

Bhattacharyya, Dilip K., 1999, "On the Economic Rationale of Estimating the Hidden Economy", *The Economic Journal*, 109(456), pp. 348-359.

Bejaković, Predrag, 1997, "Procjena veličine neslužbenog gospodarstva u izabranim zemljama", *Financijska praksa*, 21(5-6), pp. 91-124.

Državni zavod za statistiku, *Mjesečna izvješća*, (Central Bureau of Statistics, Republic of Croatia, Monthly Reports, various issues)

European Regional Statistics - Reference Guide, 2003, http://www.eudatashop.de/download/DE/klassifi/ncronos/thema1/reg_guid.pdf

EUROSTAT, European System of account - ESA 1995.

Feige, Edgar L., 1989, *The underground economies: Tax evasion and information distortion*, Cambridge: Cambridge University Press.

Feige, Edgar L., 1990, "Defining and Estimating Underground and Informal Economies: The New Institutional Approach", *World Development*, 18(7), pp. 989-1002.

Fichtenbaum, Ronald, 1989, "The productivity slowdown and the underground economy", *Quarterly Journal of Business and Economics*, 28(3), pp. 78-90.

Johnson, Simon, Kaufman, Daniel i Andrei Shleifer, 1997, "The Unofficial Economy in Transition", *Brookings Paper on Economic Activity*, 2, Spring, pp. 159-221.

Johnson, Simon, Kaufman, Daniel and Pablo Zoido-Lobaton, 1998, "Regulatory Sicretion and the Unofficial Economy", *The American Economic Review*, 88(2), pp. 387-392.

Kaufman, Daniel and Aleksander Kaliberda, 1996, "Integrating the Unofficial Economy into the dynamics of the post socialist Economies: a Framework of Analyses and Evidence", *Policy Research working paper*, 1691.

Karajić, Nenad, 2002, "Siromaštvo i neslužbeno gospodarstvo u Hrvatskoj - kvalitativni aspekti", *Financijska teorija i praksa*, 26(1), pp. 273-299.

Lacko, Maria, 1998, "The Hidden Economies of Visegrad Countries in International Comparison: A household Electricity Approach", in L. Halpern and C. Wyplosz, ed., *Hungary: Toward a Market Economy*, pp. 1288-152, Cambridge (Mass.): Cambridge University Press.

Loayza, Norman V, 1996, "The Economics of the Informal Sector: a simple Model and some Empirical Evidence from Latin America", Carnegie-Rochester Conference Series on Public Policy 45, pp. 129-162.

Lovrinčević, Željko and Davor Mikulić, 2005, "Analitičke podloge za izradu klasifikacije prostornih jedinica za statistiku u Republici Hrvatskoj (NUTS II i NUTS III razina EU)", The Institute of Economics, Zagreb and Central Bureau of Statistics.

Ministarstvo financija, Godišnje izvješće za 2002.-2003. godinu (Croatian Ministry of Finance, Annual Report 2002-2003)

OECD, 1997, "Framework for the Measurement of Unrecorded Economic Activities in Transition Economies", *OECD Working Paper*, 177.

Schneider, Friedrich, 2000, "The Increase of the Size of the Informal Economy of 18 OECD Countries: some Preliminary Explanations", paper at the conference "Annual Public Choice Meeting", Charleston, S.C.

Schneider, Friedrich and Dominik Enste, 2000, "Shadow Economies Around the World: Size, Causes, and Consequences", *IMF Working paper*, 26.

Schneider, Friedrich, 2002, "Size and Measurement of the Informal economy in 110 Countries around the World", paper at the conference "Workshop of Australian National Tax Centre", ANU, Canberra, Australia.

Schneider, Friedrich, 2003, "Veličina i razvoj sive ekonomije i radne snage u sivoj ekonomiji u 22 tranzicijske zemlje i 21 zemlji OECD-a: Što doista znamo?", *Financijska teorija i praksa*, 27(1), pp. 1-29.

Tanzi, Vito, 1999, "Uses and Abuses of Estimates of the Underground Economy", *The Economic Journal*, 109(456), pp. 338-340.

Weeks, John, 1975, "Policies for expanding employment in the informal sector of developing economies", *International Labor Review*, 111(1), pp. 1-14.