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Shadow Economies in Latvia and other European Countries: What do we (not) know?

Outline

1. **Introduction: Statements about the Shadow Economy**
2. **Some Theoretical Considerations about the Shadow Economy**
3. **The Size of the Shadow Economies: Econometric Estimates and Results**
4. **Summary and Policy Conclusions**

1.1 Statements about the Shadow Economy

(1) Size and development of the shadow economy is „hot“ scientific and political topic around the world.

(2) Numerous political statements that the shadow economy causes severe damages on the „official“ economy.

(3) „Unfair“ (ruinous) competition between entrepreneurs working in the shadow economy and those working in the official economy only!

(4) Mostly demanded by politicians only one common policy measure: increase effective punishment to get rid of the shadow economy.

1.2 Aim of this presentation

(1) Theoretical considerations and methods to estimate the shadow economy.

(2) Empirical investigation about the size and development of the shadow economies in Latvia and other European countries.

(3) Policy conclusions in order to reduce the shadow economy.

2.1. Defining the Shadow Economy

(i) ***The shadow economy*** **includes all *legal* production and provision of goods and services that are deliberately concealed from public authorities for the following four reasons:**

(1) To avoid payment of *income*, *value added* or *other taxes*,

(2) To avoid payment of *social security contributions*,

(3) To avoid *regulatory requirements* such as minimum wages, maximum hours, safety standards, etc., and

(4) To avoid *compliance with certain administrative procedures*, such as the completion of statistical questionnaires or other administrative forms.

2.1. Defining the Underground (Classical Crime) and Informal Household Economy

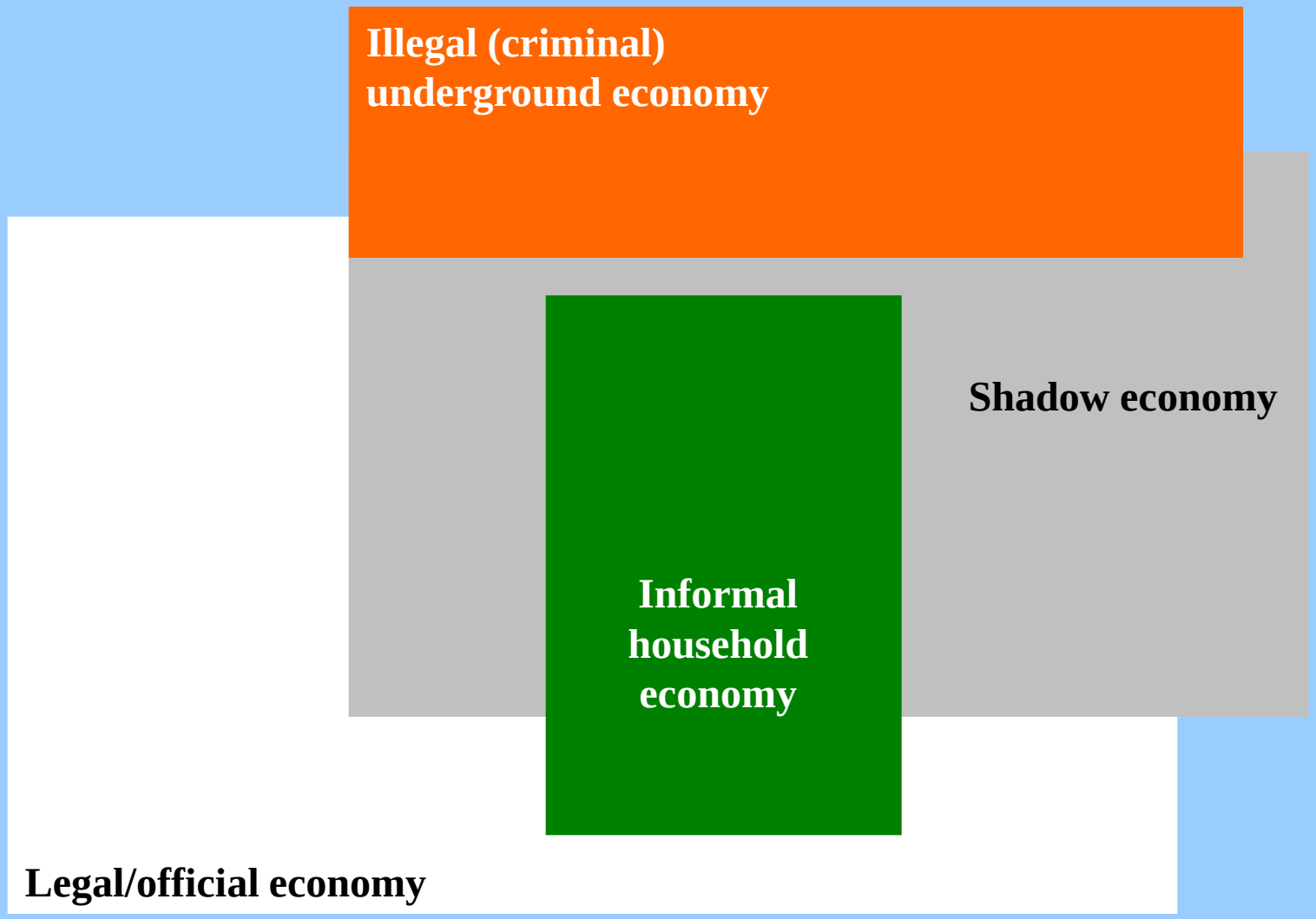
(ii) ***Underground (classical crime)*** **activities are all** ***illegal actions*** **that fit the characteristics of classical crime activities like burglary, robbery, drug dealing, etc.**

(iii) ***The informal household economy*** **consists of household enterprises that are not registered officially under various specific forms of national legislation.**

(iv) ***These two sectors*** **((ii) classical crime and (iii) household production)** ***are not included*** **in the shadow economy activities.** ***However,*** **there are overlapping areas (e.g. for (ii) prostitution and for (iii) do-it-yourself activities and neighborly help).**

2. Some Theoretical Considerations about the Shadow Economy

Figure 2.1. Legal, Shadow, Illegal and Informal Economy



2. Some Theoretical Considerations about the Shadow Economy

Table 2.1. A Taxonomy of Types of Underground Economic Activities [1)]

Type of Activity	Monetary Transactions		Non Monetary Transactions	
ILLEGAL ACTIVITIES	Trade with stolen goods; drug dealing and manufacturing; prostitution; gambling; smuggling; fraud; etc.		Barter of drugs, stolen goods, smuggling etc; produce or growing drugs for own use; theft for own use	
	Tax Evasion	Tax Avoidance	Tax Evasion	Tax Avoidance
LEGAL ACTIVITIES	Unreported income from self-employment; wages, salaries and assets from unreported work related to legal services and goods	Employee discounts, fringe Benefits	Barter of legal services and goods	All do-it-yourself work and neighborly help

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

2.2 Measuring the Shadow Economy

Three methods of measurement:

1. **Direct procedures using the micro level and aiming at determining the size of the shadow economy. An example of this method are surveys.**
2. **Indirect procedures that make use of macroeconomic indicators following the development of the shadow economy over time.**
3. **Statistical models that use statistical tools to estimate the shadow economy as an "unobserved" variable.**

2.2. Estimation of the Size of the Shadow Economy

MIMIC Estimation Procedure

- **Modeling the shadow economy as an unobservable (latent) variable**
- **Description of the relationships between the latent variable and its causes in a structural model:** $\eta = \gamma x + \varsigma$
- **Link between the latent variable and its indicators is represented in the measurement model:** $y = \lambda\eta + \varepsilon$

η: latent variable (shadow economy)
x: q vector of causes in the structural model
y: p vector of indicators in the measurement model
γ: q vector of coefficient of the causes in the structural model
λ: p vector of coefficient in the measurement model
ς, ε: error terms in the structural model and the measurement model, respectively

2.2. Estimation of the Size of the Shadow Economy

MIMIC Estimation Procedure (cont.)

► **Specification of structural equation:**

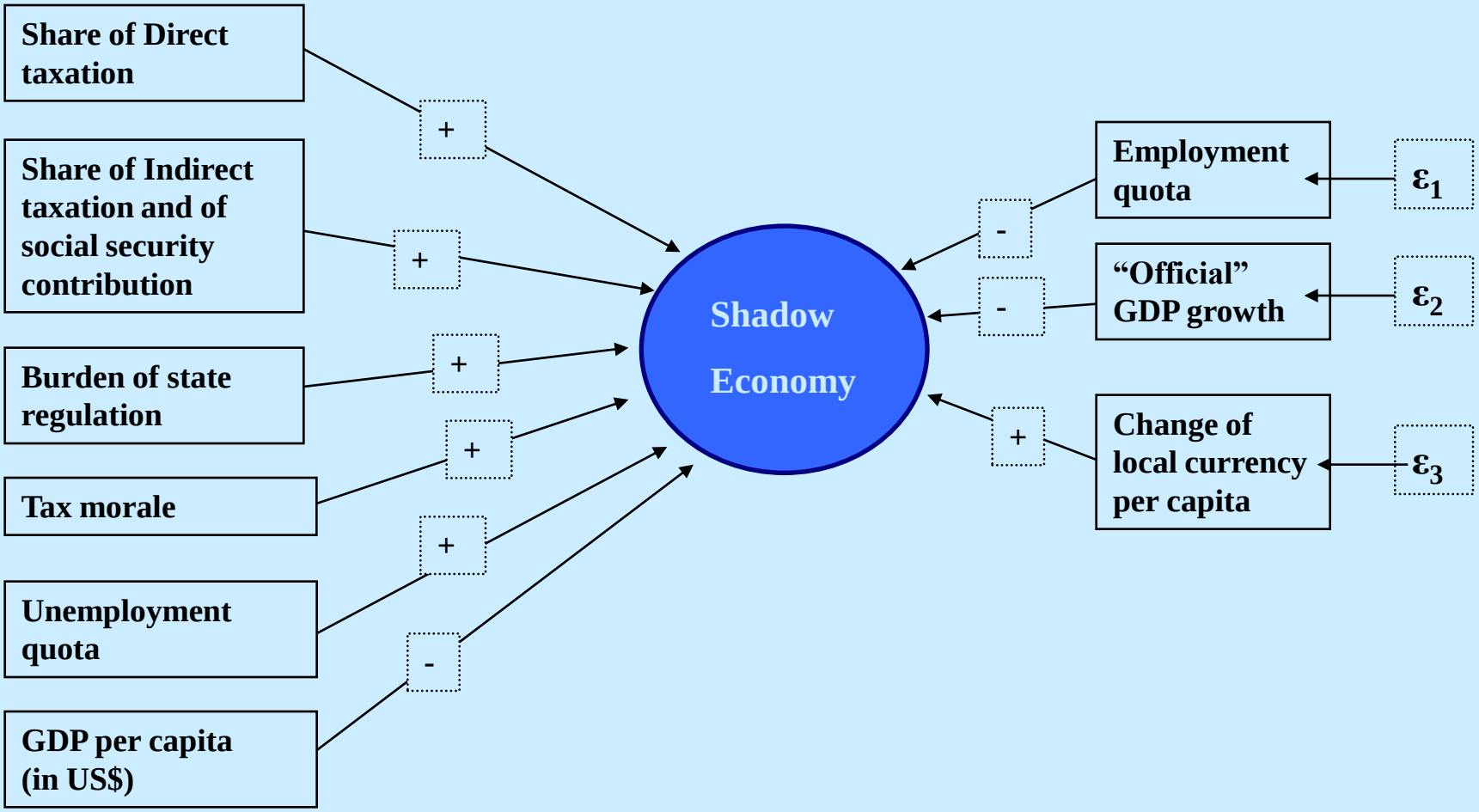
$$[\text{Shadow economy}] = [\gamma_1, \gamma_2, \gamma_3, \gamma_4, \gamma_5, \gamma_6, \gamma_7, \gamma_8] \cdot \begin{vmatrix} [\text{Share of direct taxation}] \\ [\text{Share of indirect taxation}] \\ [\text{Share of social security burden}] \\ [\text{Burden of state regulations}] \\ [\text{Quality of state institutions}] \\ [\text{Tax morale}] \\ [\text{Unemployment quota}] \\ [\text{GDP per capita}] \end{vmatrix} + \varsigma$$

► **Specification of measurement equation:**

$$\begin{vmatrix} \text{Employment Quota} \\ \text{Change of local currency} \\ \text{Official GDP growth} \end{vmatrix} = \begin{vmatrix} \lambda_1 \\ \lambda_2 \\ \lambda_3 \end{vmatrix} \cdot \begin{pmatrix} \text{Shadow} \\ \text{Economy} \end{pmatrix} + \begin{vmatrix} \varepsilon_1 \\ \varepsilon_2 \\ \varepsilon_3 \end{vmatrix}$$

2. Estimation of the Size of the Shadow Economy

Figure 2.2. Path Diagram of the MIMIC Model



(1) Time Period: 1990-2008

(2) The estimations of the currency demand method for single countries will be used to transform the ordinal index to cardinal value of shadow economy.

2.2 Measuring the Shadow Economy

Estimation procedure of this paper:

1. **The estimation of the shadow economy is based on a combination of the MIMIC procedure and the currency demand method.**
2. **The first assumes that the shadow economy is an unobservable phenomenon (latent variable) which is estimated using *causes* of illicit employment, e.g. tax burden, regulation intensity, and *indicators* reflecting illicit activities, e.g. currency demand and employment quota. A disadvantage of the MIMIC procedure is that it produces only relative estimates of the size of the shadow economy.**
3. **The currency demand method is used to calibrate the relative estimates into absolute ones by using two or three absolute values of the absolute size of the shadow economy.**

2.3 The Main Causes of Determining the Shadow Economy

i. Tax and Social Security Contribution Burdens

The first institutional factor is the overall tax and social security contribution burden.

The bigger the difference between the total cost of labour in the official economy and the after-tax earnings (from work), the greater is the incentive to avoid this difference and to work in the shadow economy.

2.3 The Main Causes of Determining the Shadow Economy

ii. Intensity of Regulations

The public institution of state (especially labour market) regulation is a second factor which reduces the freedom (of choice) for individuals engaged in the official economy.

Regulations lead to a substantial increase in labour costs in the official economy; they provide an incentive to work in the shadow economy, where they can be avoided.

2.3 The Main Causes of Determining the Shadow Economy

iii. Public Sector Services

A shadow economy can lead to less public revenues which in turn reduce the quality and quantity of publicly provided goods and services.

Ultimately, this can lead to an increase in the tax rates with the consequence of even stronger incentives to participate in the shadow economy.

2.3 The Main Causes of Determining the Shadow Economy

iv. Other Public Institutions

➔ **Recently, various authors (e.g. Lars Feld, Bruno Frey, Benno Torgler) consider quality of public institutions as another key factor of the development of the informal sector.**

➔ **In particular, corruption of bureaucracy and government officials is associated with larger unofficial (shadow) activities, while a good rule of law by securing property rights and contract enforceability, increases the benefits of being formal.**

2.3 The Main Causes of Determining the Shadow Economy

iv. Other Public Institutions (cont.)

➔ **Under a federal system, the competition among jurisdictions and the mobility of individuals can act as an important constraint on politicians' "choices", so that they have to adopt a policy, which is closer to a majority of voters' preferences.**

➔ **This leads to the hypothesis that the size of the shadow economy should be lower in federal than in non-federal countries, ceteris paribus.**

2. Some Theoretical Considerations about the Shadow Economy
2.3 The Main Causes of Determining the Shadow Economy

Table 2.2. The Main Causes of the Increase of the Shadow Economy

Factors influencing the shadow economy	Influence on the shadow economy (in %)	
	(a)	(b)
(1) Increase of the Tax and Social Security Contribution Burdens	35-38	45-52
(2) Quality of State Institutions	10-12	12-17
(3) Transfers	5-7	7-9
(4) Specific Labour Market Regulations	7-9	7-9
(5) Public Sector Services	5-7	7-9
(6) Tax Morale	22-25	-
Influence of all Factors	84-98 %	78-96 %

(a) Average values of 12 studies.
(b) Average values of empirical results of 22 studies.

Source: Schneider (2004, 2005, 2007)

3.1 Hypotheses

Using the theoretical considerations, we develop the following eight hypotheses, which will be empirically tested:

1. **An increase in direct and indirect taxation increases the shadow economy, ceteris paribus.**
2. **An increase in social security contributions increases the shadow economy, ceteris paribus.**
3. **The more the country is regulated, the greater the incentive is to work in the shadow economy, ceteris paribus.**
4. **The lower the quality of state institutions, the higher the incentive to work in the shadow economy, ceteris paribus.**

3.2 Specification of the Independent Variables

3.2.1 Tax and Social Security Contribution Burdens

The concrete measurement of the tax and social security contribution burdens is challenging. In order to have some general comparable proxies for this, we use the following variables:

(1) *Indirect taxes* as a proportion of total overall taxation; (*positive sign expected),*

(2) *Direct taxes* as proportion of overall taxation; (*positive sign expected),*

(3) Size of government: general government final consumption expenditures (in percent of GDP; *positive sign expected),*

(4) *Fiscal freedom*, which measures the fiscal burden in an economy; i.e. top tax rates on individual and corporate income. The index ranges from 0 to 100, where 0 is least fiscal freedom and 100 maximum degree of fiscal freedom *(negative sign expected).*

3.2 Specification of the Independent Variables

3.2.2 Intensity of Regulations

We use the following three variables:

(1) *Business freedom:*

It ranges from 0 to 100, where 0 is least business freedom and 100 maximum business freedom *(negative sign expected),*

(2) *Economic freedom:*

Heritage Foundation economic freedom index which ranges from 0 to 100, where 0 is least economic freedom and 100 maximum economic freedom *(negative sign expected),*

3.2 Specification of the Independent Variables

3.2.2 Intensity of Regulations (cont.)

(3) *Regulatory quality* (World Bank):

It includes measures of the incidents of market-unfriendly policies, such as price controls or inadequate bank supervision, as well as perceptions of the burdens imposed by excessive regulation in foreign trade and business development. The index scores between – 2.5 and +2.5 with higher scores corresponding to better outcomes *(negative sign expected)*.

3.2 Specification of the Independent Variables

3.2.3 Public Sector Services

Government effectiveness **(World Bank):**

It captures perceptions of

- ➔ **the quality of public services,**
- ➔ **the quality of the civil service,**
- ➔ **the degree of its independence from political pressures,**
- ➔ **the quality of policy formulation and implementation, and**
- ➔ **the credibility of a government's commitment on such policies.**

The scores of this index lie between – 2.5 and + 2.5 with higher scores corresponding to better outcomes (negative sign expected).

3.2 Specification of the Independent Variables

3.2.4 State of the Official Economy

(1) ***GDP per capita*** **based on Purchasing Power Parity (PPP), measured in constant 2005 US$** ***(negative sign expected),***

(2) ***Unemployment rate*** **(in percent of total labour force)** ***(positive sign expected),***

(3) ***Inflation rate:*** **GDP deflator (annual rate in percent)** ***(positive sign expected),***

(4) ***Openness:*** **Openness corresponds to trade (in percent of GDP). Trade is the sum of exports and imports of goods and services** ***(negative sign expected).***

3.2 Specification of the Independent Variables

3.2.5 Monetary Indicators

(1) M0 over M1:

M0 corresponds to the currency outside the banks and for M1 (*negative sign expected*), or

(2) Currency M0 over M2:

It corresponds to the currency outside the banks as a proportion of M2 (*positive sign expected*).

3.2 Specification of the Independent Variables

3.2.6 Labour Market Indicators

(1) ***Labour force participation rate:*** **Labour force participation rate is a proportion of the population that is economically active *(negative sign expected),***

(2) ***Growth rate of the total labour force:*** **Total labour force compromises people aging 15 and older who meet the ILO definition of the economically active population *(negative sign expected).***

3.2 Specification of the Independent Variables

3.2.7 State of the Official Economy

(1) GDP per capita:

GDP per capita is gross domestic product converted to international dollars using Purchasing Power Parity rates, divided by the population *(negative sign expected)*,

(2) Annual growth rate of GDP per capita:

Annual growth rate of GDP per capita as defined in (1) *(negative sign expected)*.

Table 3.1. MIMIC Model Estimation Results – Part 1a

Independent variables	Spec. 1: 98 Develop. Count. (1994 - 2006)	Spec. 2: 88 Develop. Count. (1994 - 2006)	Spec. 6: 151 Count. (1996 - 2007)	Spec. 7: 120 Count. (1996 - 2006)
Causal variables				
Size of government	**0.14 (5.97)*** **	**0.15 (5.57)*** **	**0.05 (2.64)*** **	**0.10 (3.77)*** **
Share of direct taxation	**-**	**0.06 (2.57)** **	**-**	**0.05 (2.39)** **
Fiscal freedom	**- 0.06 (2.90)*** **	**- 0.03 (1.69)* **	**-**	**- 0.04 (2.08)** **
Business freedom	**- 0.05 (2.18)** **	**- 0.05 (2.33)** **	**-**	**- 0.04 (1.84)* **
Unemployment rate	**0.01 (0.67)**	**- 0.00 (0.06)**	**0.04 (2.08)** **	**0.02 (0.89)**
GDP per capita	**- 0.27 (8.79)*** **	**- 0.26 (6.87)*** **	**- 0.38 (15.89)*** **	**- 0.33 (9.15)*** **
Government effectiveness	**-**	**-**	**- 0.05 (2.64)*** **	**- 0.04 (2.11)** **

Note: Absolute z-statistics in parentheses. ***, **, * denote significance at the 1, 5, and 10% significance level. All variables are used as their standardized deviations from mean. According to the MIMIC models identification rule (see also section 3.1), one indicator has to be fixed to an a prior value. We have consistently chosen the currency variable. The degrees of freedom are determined by $0.5(p+q)(p+q+1)-t$; with p= number of indicators; q = number of causes; t = the number for free parameters.

Table 3.1. MIMIC Model Estimation Results – Part 1b

Independent variables	Spec. 1: 98 Develop. Count. (1994 - 2006)	Spec. 2: 88 Develop. Count. (1994 - 2006)	Spec. 6: 151 Count. (1996 - 2007)	Spec. 7: 120 Count. (1996 - 2006)
Indicator variables				
Growth rate of GDP per capita	**- 1.01 (7.88)*** **	**-1.39 (6.70)*** **	**- 0.79 (10.93)*** **	**-0.99 (8.42)*** **
Labor force participation rate	**0.05 (0.59)**	**0.02 (0.14)**	**- 0.19 (3.15)*** **	**-**
Growth rate of labor force	**-**	**-**	**-**	**- 0.16 (1.76)***
Currency (M0 / M1)	**1.00**	**1.00**	**1.00**	**1.00**
RMSEA (*p*-value)	**0.03 (0.99)**	**0.03 (0.99)**	**0.03 (1.00)**	**0.02 (1.00)**
Chi-square (*p*-value)	**38.70 (0.00)**	**44.43 (0.02)**	**29.95 (0.00)**	**51.82 (0.03)**
AGFI	**0.98**	**0.98**	**0.99**	**0.98**
Degrees of freedom	**20**	**27**	**13**	**35**
Number of observations	**1045**	**741**	**1563**	**942**

Note: Absolute z-statistics in parentheses. ***, **, * denote significance at the 1, 5, and 10% significance level. All variables are used as their standardized deviations from mean. According to the MIMIC models identification rule (see also section 3.1), one indicator has to be fixed to an a prior value. We have consistently chosen the currency variable. The degrees of freedom are determined by 0.5(p+q)(p+q+1)–t; with p= number of indicators; q = number of causes; t = the number for free parameters.

Table 3.1. MIMIC Model Estimation Results – Part 2a

Independent variables	Spec. 3: 21 Transition Countries (1994 - 2006)	Spec. 4: 25 High Income OECD Countries (1996 - 2006)	Spec. 5: 25 High Income OECD Countries. (1996 - 2007)
Causal variables			
Size of government	0.18 (3.49)***	-	-
Total tax burden	-	0.05 (2.05)**	0.06 (1.78)*
Fiscal freedom	- 0.08 (1.68)*	- 0.07 (2.84)***	-
Business freedom	-	- 0.23 (5.93)***	-
Economic freedom	- 0.09 (1.91)*	-	-
Unemployment rate	0.08 (1.84)*	0.05 (1.89)*	0.11 (3.16)***
Regulatory quality	-	- 0.21 (5.45)***	- 0.31 (6.50)***
Openness	- 0.15 (2.47)**	-	-
Inflation rate	0.22 (2.83)***	-	-

Note: Absolute z-statistics in parentheses. ***, **, * denote significance at the 1, 5, and 10% significance level. All variables are used as their standardized deviations from mean. According to the MIMIC models identification rule (see also section 3.1), one indicator has to be fixed to an a prior value. We have consistently chosen the currency variable. The degrees of freedom are determined by $0.5(p+q)(p+q+1)-t$; with p= number of indicators; q = number of causes; t = the number for free parameters.

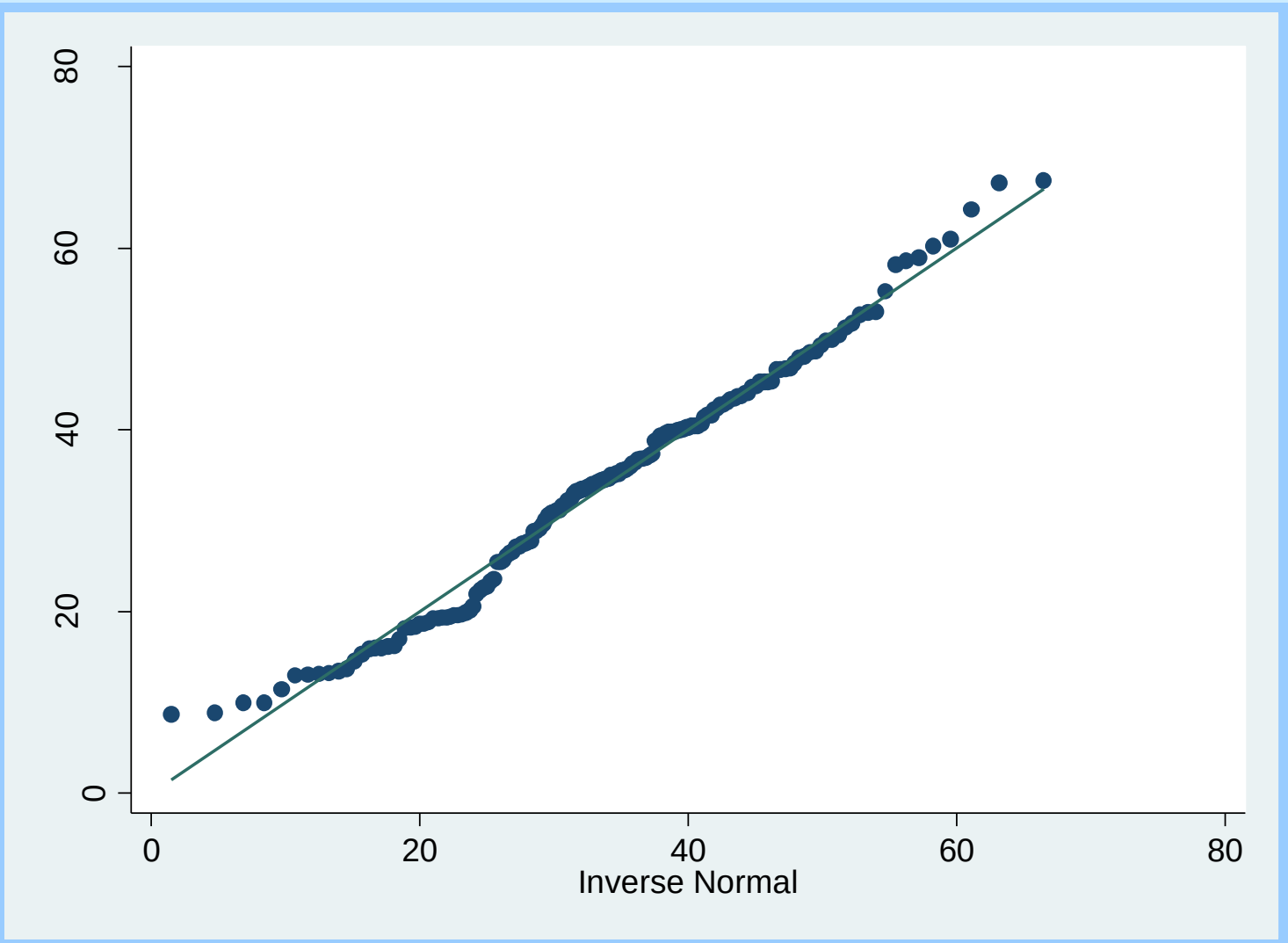
Table 3.1. MIMIC Model Estimation Results – Part 2b

Independent variables	Spec. 3: 21 Transition Count. (1994 - 2006)	Spec. 4: 25 High Income OECD Countries (1996 - 2006)	Spec. 5: 25 High Income OECD Countries (1996 - 2007)
Indicator variables			
Growth rate of GDP per capita	- 0.76 (4.41)***	-	-
GDP per capita	-	- 1.52 (6.71)***	- 1.25 (8.36)***
Labor force participation rate	-	- 1.11 (5.45)***	- 1.03 (7.70)***
Growth rate of labor force	- 0.83 (3.90)***	-	-
Currency (M0 / M1)	1.00	1.00	1.00
RMSEA (*p*-value)	0.00 (1.00)	0.00 (0.88)	0.00 (0.99)
Chi-square (*p*-value)	17.75 (0.91)	17.74 (0.60)	3.55 (0.94)
AGFI	0.97	0.95	0.99
Degrees of freedom	27	20	9
Number of observations	213	145	243

Note: Absolute z-statistics in parentheses. ***, **, * denote significance at the 1, 5, and 10% significance level. All variables are used as their standardized deviations from mean. According to the MIMIC models identification rule (see also section 3.1), one indicator has to be fixed to an a prior value. We have consistently chosen the currency variable. The degrees of freedom are determined by 0.5(p+q)(p+q+1)–t; with p= number of indicators; q = number of causes; t = the number for free parameters.

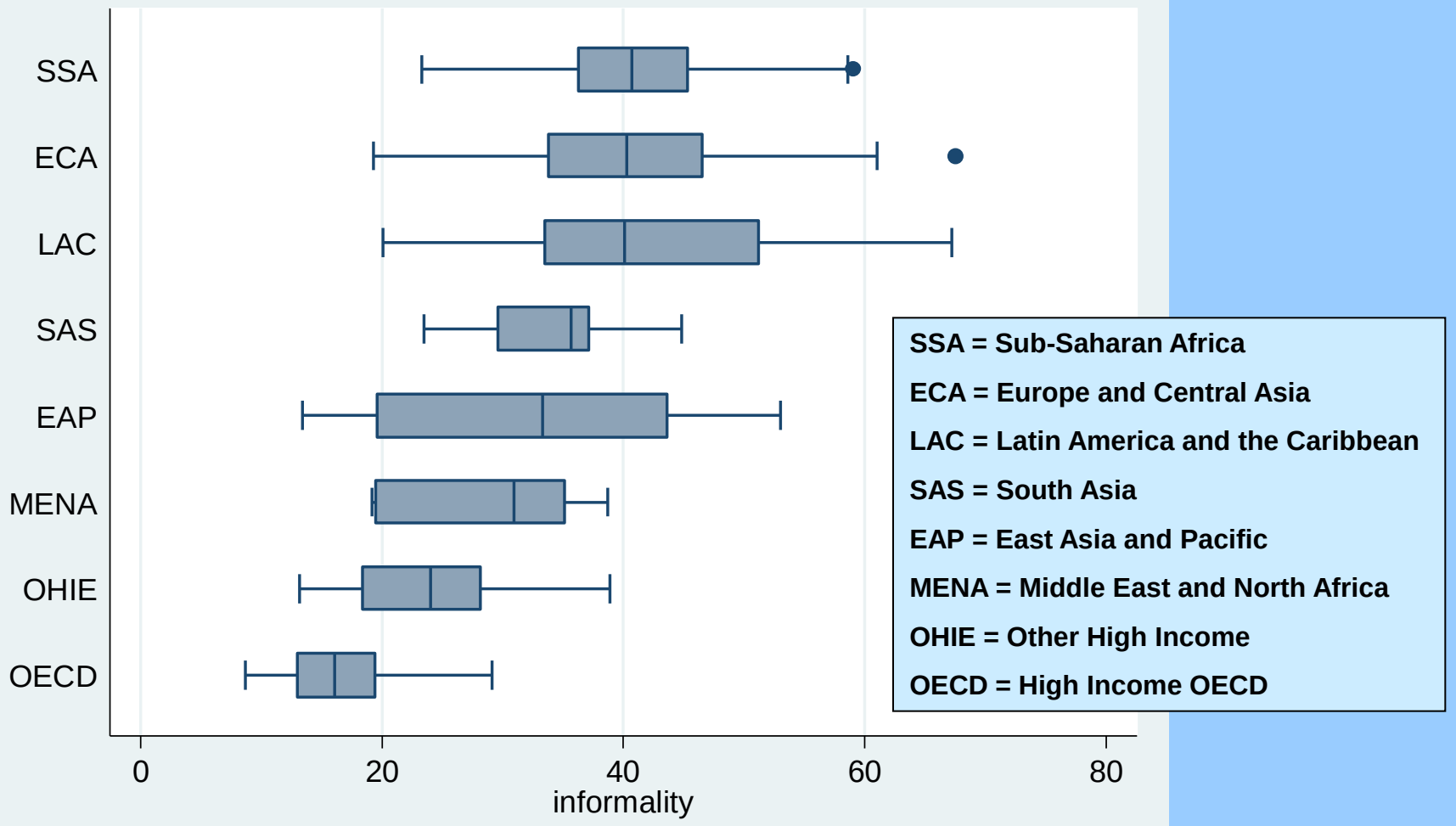
3. Estimation and Size of the Shadow Economies

Figure 3.1. Q-Q Plot of the Informality Measure



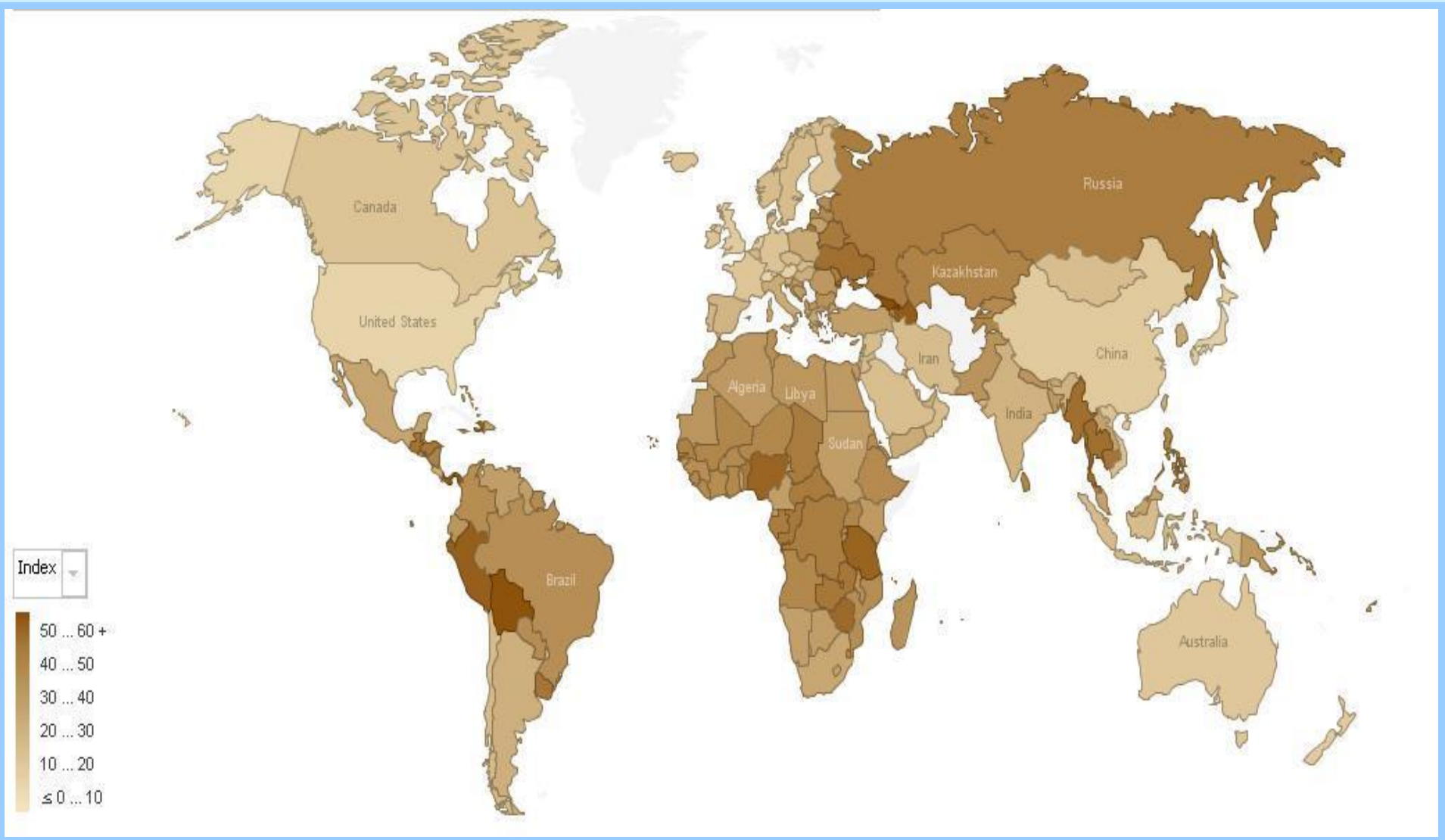
3. Estimation and Size of the Shadow Economies

Figure 3.2. Average Shadow Economy Measure by World Bank Region



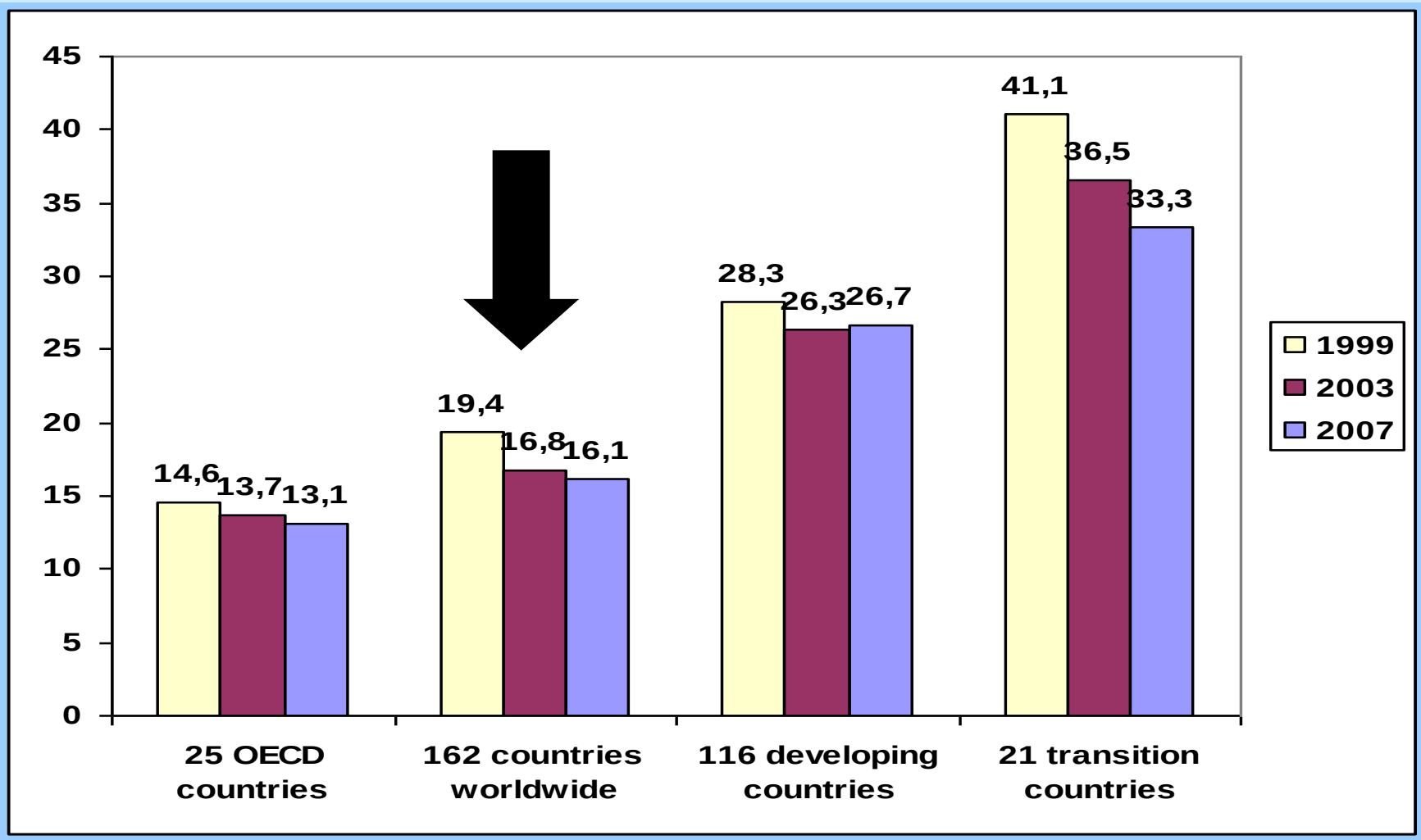
3. Estimation and Size of the Shadow Economies

Figure 3.3. World View of Informality



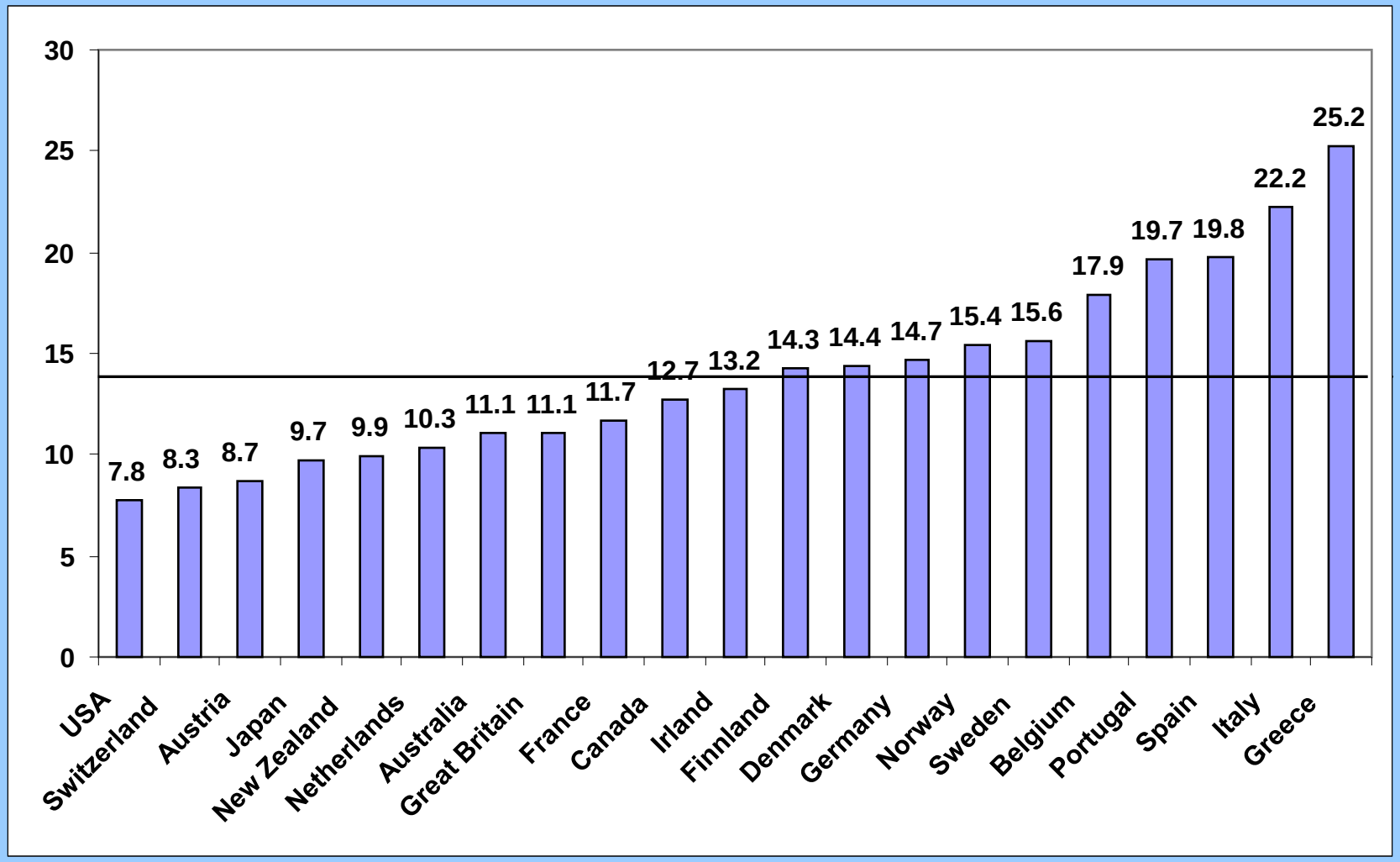
3. Estimation and Size of the Shadow Economies

Figure 3.4. Size and Development of the Shadow Economy of Various Country Groups (*Weighted Averages (!)* in Percentage of Official Total GDP of the Respective Country Group)



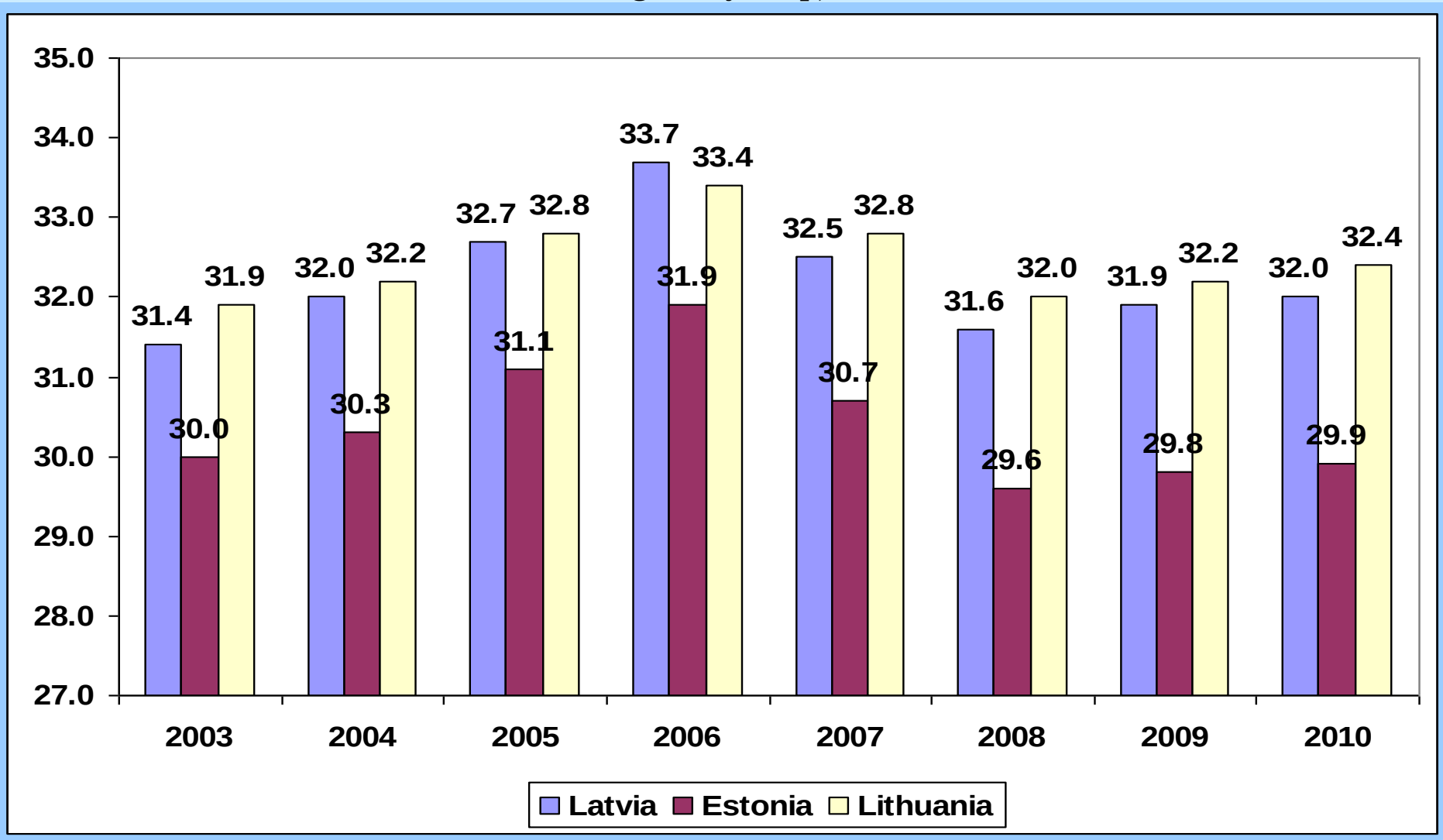
3. Estimation and Size of the Shadow Economies

Figure 3.5. Size of the Shadow Economy in *21 OECD Countries* in 2010 (Projection); Method: MIMIC and Currency Demand Approach



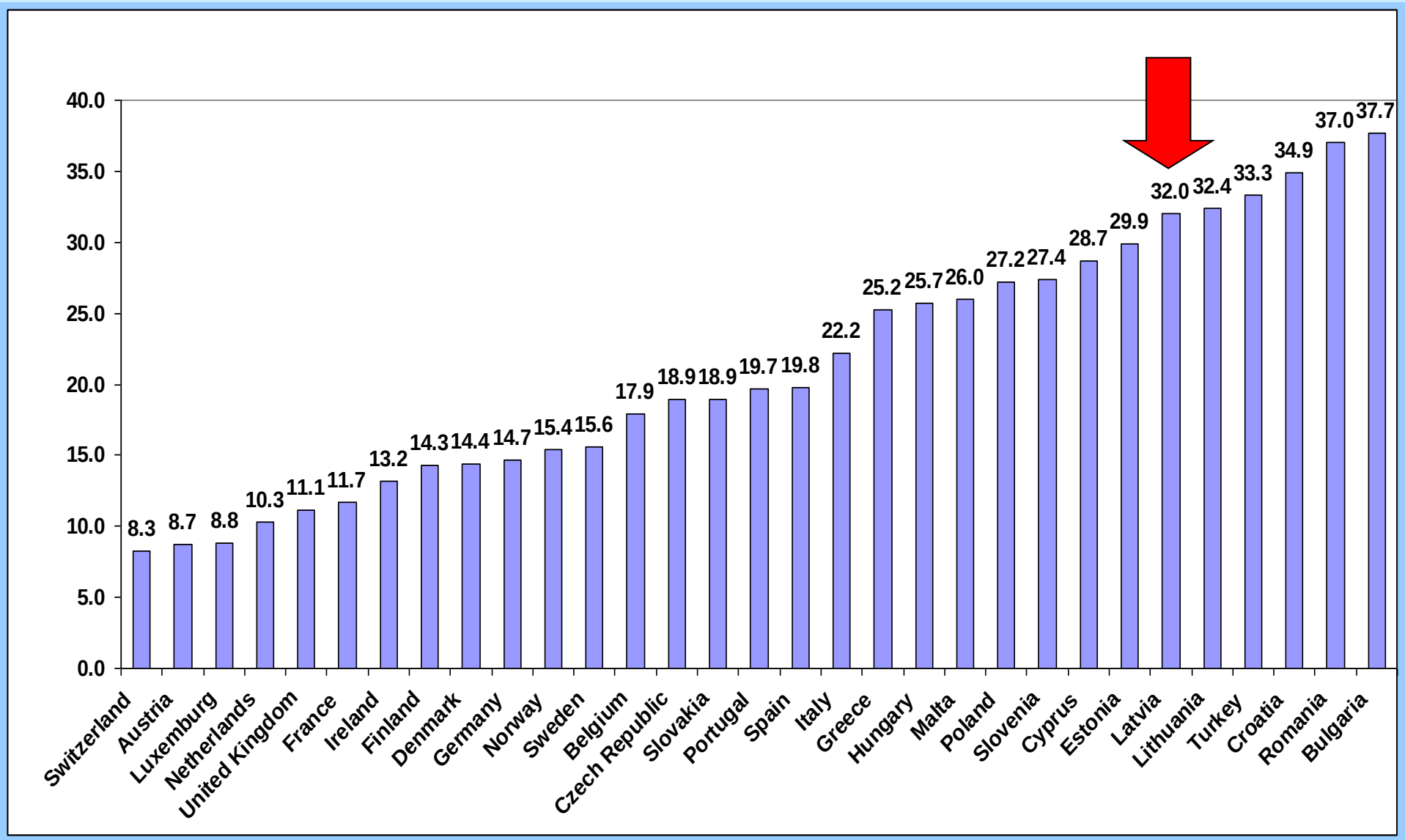
3. Estimation and Size of the Shadow Economies

Figure 3.6. Size and Development of the Shadow Economy of Latvia (Including Do-it-yourself Activities and Neighborly Help) over 2003 to 2010.



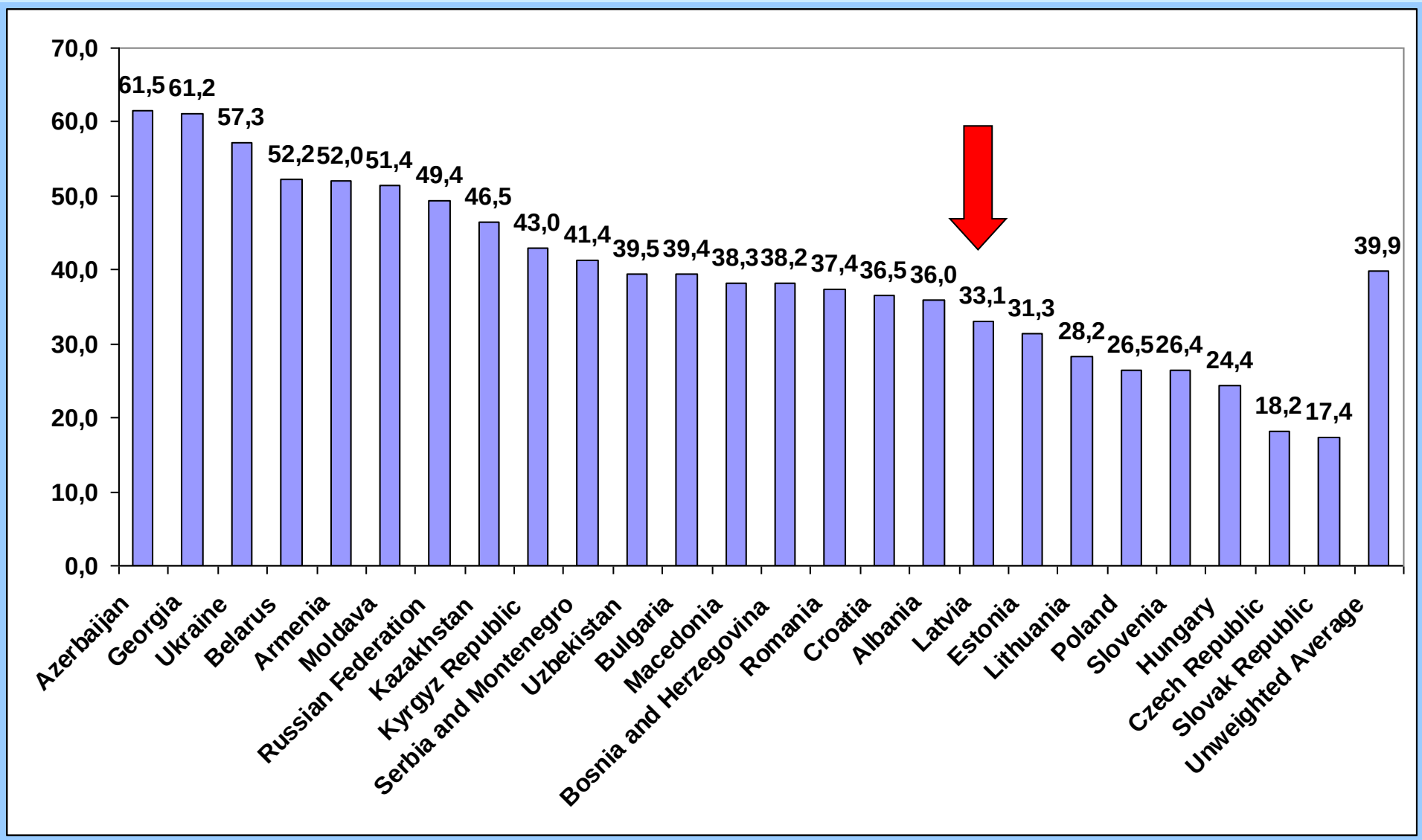
3. Estimation and Size of the Shadow Economies

Figure 3.7. Size of the Shadow Economy of 31 European Countries 2010



3. Estimation and Size of the Shadow Economies

Figure 3.8. Size of the Shadow Economy in 26 East and Central European and Former Soviet Union Countries – 2006/07



4. Summary and Policy Conclusion
4.1 Policy Measures

(1) The most important question is whether the decreasing size of the shadow economy is a blessing or a curse:

- → **Assuming that 2/3 of all activities in the shadow economy complement those in the official sector (i.e. *those goods and services would not be produced in the official economy*), the development of the shadow economy can lead to a higher *total* GDP (=shad. GDP + off. GDP)**
- → **Hence, a decline of the shadow economy will increase the social welfare only if almost all of it is transferred into the official economy. It is therefore necessary to implement such economic and fiscal measures that strongly increase the incentive to move the production from the unofficial sector into the official economy.**
- → **Only then the decline of the shadow economy will be a blessing for the entire economy.**

4.1 Policy Measures

(2) The rigidity of the (West.) European labour market and the high tax and social system contributions burden are the two very important causes of the relatively large shadow economy in most European OECD countries, compared to the US.

However, attempts to reduce non-wage labour cost were only moderately successful, and might lead to public deficits.

4. Summary and Policy Conclusion

4.1 Policy Measures

(3) To reduce the shadow economy, a policy option is reimbursing VAT on labor intensive services (the so-called Luxembourg model) in order to strengthen the incentive to supply those services in the official economy.

(4) Another policy option is to make household investments (e.g. in Germany 1.200 € per household per year) tax deductible, i.e. if you need a bill you cannot do it in the shadow economy.

(5) Increased punishment and detection rates can also be successful, especially in the areas connected with organized crime (e.g. prostitution).

4.2 Conclusion

Finally, we draw three conclusions:

1. **First, shadow economies are a complex phenomenon. People engage in shadow economic activities for a variety of reasons, like government actions, most notably, taxation and regulation, and the (non-)functioning of public institutions.**

2. **Second, a government aiming to decrease shadow economic activities needs to analyze the complex relationships between the official and shadow economy to take into account the consequences of its own policy decisions.**

4.2 Conclusion

3. **Considering a public choice perspective a final and third conclusion is that a government may not have such a great interest to reduce the shadow economy due to the following reasons:**
   - i. **income earned in the shadow economy increases the standard of living of at least 1/3 of the working population,**
   - ii. **between 40 and 50% of the shadow economy activities have a complementary character, which means that additional value added is created increasing the overall (official plus unofficial) GDP,**
   - iii. **tax losses my be moderate, as at least 2/3 of the income earned in the shadow economy is immediately spent in the official economy, and**
   - iv. **people working in the shadow economy have less time for other things like going to demonstrations, etc.**

4.2 Conclusion

Considering these three conclusions, it is obvious that there are two big challenges for every government:

The first is to undertake efficient incentive orientated policy measures in order to make work less (more) attractive in the shadow (official) economy.

The second is to have public institutions working efficiently and acting as a constraint for selfish politicians.