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# **Shadow Economy and Corruption**

## **– What have we learned over the past 20 years?**

# Content

- 1) Introduction**
- 2) Theoretical Considerations**
- 3) Estimation and Size of the Shadow Economies in Italy and in Other OECD Countries**
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- 5) Policy Measures to Reduce the Shadow Economy and Corruption**
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# 1. Introduction

- (1) Size and development of the shadow economies as well of corruption are „hot“ scientific and political topics around the world.**
- (2) Numerous political statements, that the shadow economy as well as corruption cause severe damages on the „official“ economy.**
- (3) „Unfair“ (ruinous) competition between the entrepreneurs working in the shadow economy or using bribes and the ones working in the official economy!**
- (4) Mostly only one common policy measure: increase effective punishment to get rid of the shadow economy and/or of corruption.**

# 1. Introduction

The goal of this paper is *threefold*:

- (ii) To present the size and development of the shadow economies in some OECD countries and to undertake an analysis of the causes.**
- (ii) An analysis of the effect of corruption on the shadow economy is undertaken, and the extent of its damage on the Italian official economy is shown up to 2014.**
- (iii) Furthermore, policy measures to reduce the shadow economy and corruption are presented.**

## 2. Theoretical Considerations – 2.1 Definitions

- (1) 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:
- (i) to avoid payment of income, value added or other taxes;
  - (ii) to avoid payment of social security contributions;
  - (iii) to avoid having to meet certain legal standards such as minimum wages, maximum working hours, etc.; and
  - (iv) to avoid complying with certain administrative procedures.

## 2. Theoretical Considerations – 2.1 Definitions

The *underground (classical crime) and informal household activities* are:

- (2) Underground (classical crime) activities are all illegal actions that fit the characteristics of classical crime activities like burglary, robbery, drug dealing, etc.
- (3) Informal household economy consists of household enterprises that are not registered officially under various specific forms of national legislation.
- (4) These two activities ((1) classical crime and (2) household production) are not included in the shadow economy activities. However, there are overlapping areas (e.g. ad (1) prostitution and ad (2) do-it-yourself activities).

## 2. Theoretical Considerations – 2.1 Definitions

(5) ***Corruption*** is commonly defined as the misuse of public power for private benefit.

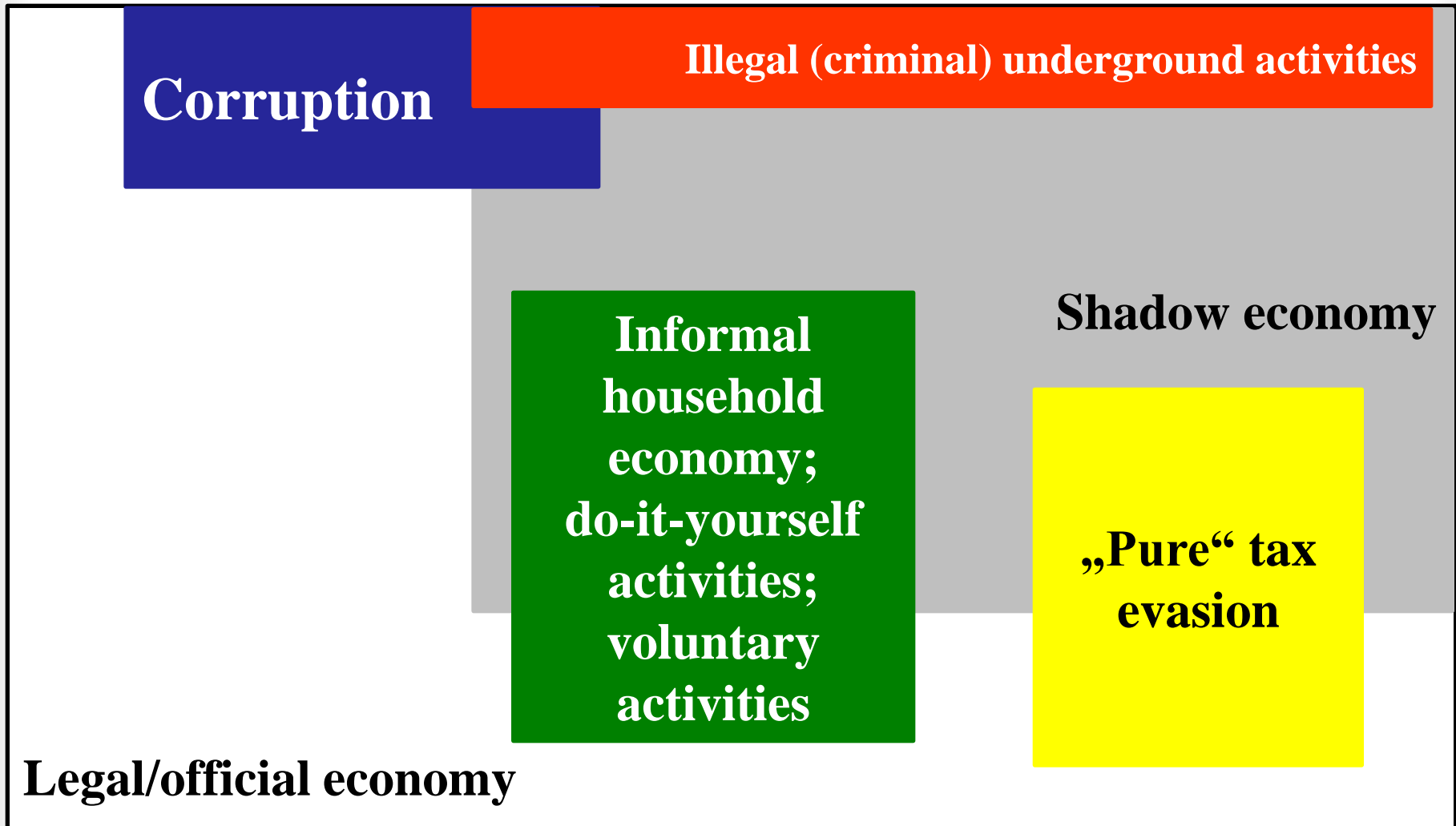
The term “*private benefit*” relates to receiving money or valuable assets.

“*Public power*” is exercised by bureaucrats, appointed to their office, and by politicians.

The extent of ***corruption*** is measured/captured by the International Transparency Corruption Index since the year 2000 using the survey method; but also other measures based on indices and questionnaires exist.

## 2. Theoretical Considerations – 2.1 Definitions

Figure 2.1: Legal, shadow, illegal and informal economy as well as tax evasion



Source: Friedrich Schneider, University of Linz, 2012



## 2. Theoretical Considerations

### 2.2 Theoretical considerations about the *shadow economy* and corruption

**What are the main causes determining the size of the shadow economy?**

***(i) Tax and social security contribution burdens***

**The higher, the higher the shadow economy, *ceteris paribus*.**

***(ii) Intensity of regulations***

**The higher, the higher the shadow economy, *ceteris paribus*.**

***(iii) Public Sector Services***

**The lower, the higher the shadow economy, *ceteris paribus*.**

## 2. Theoretical Considerations

### 2.2 Theoretical considerations about the *shadow economy* and corruption

**What are the main causes determining the size of the shadow economy (cont.)?**

***(iv) Tax morale***

**The lower, the higher the shadow economy, *ceteris paribus*.**

***(v) Quality of public institutions***

**In particular, corruption 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, *ceteris paribus*.**

***(vi) Federal (direct democratic) system***

**Decrease in the shadow economy, *ceteris paribus*.**

## 2. Theoretical Considerations

### 2.2 Theoretical considerations about the *shadow economy* and corruption

**What are the main indicators of the shadow economy?**

***(vii) Amount of cash in circulation (ratio of M0 to M1)***

**The larger the shadow economy, the more cash circulates, *ceteris paribus*.**

***(viii) Official GDP-growth***

**The larger the shadow economy, the smaller is official GDP-growth, *ceteris paribus*.**

***(ix) Official labor force participation rate***

**The larger the shadow economy, the lower the official labor force participation rate, *ceteris paribus*.**

## 2. Theoretical Considerations

### 2.2 Theoretical considerations about the shadow economy and *corruption*

Two *traditional* hypotheses about the relationship between the shadow economy and corruption:

The shadow economy and corruption are

- (1) **substitutes** (e.g. Rose-Ackermann, 1997), i.e. they can be replaced by each other, or
- (2) **complements** (Thum, 2015), i.e. they require each other (Friedmann et al., 2000).

➔ *Empirical evidence has so far been very mixed.*

## 2. Theoretical Considerations

### 2.2 Theoretical considerations about the shadow economy and *corruption*

Two *newer* hypotheses about the relationship between the shadow economy and corruption by Dreher and Schneider (2009):

- (1) The shadow economy and corruption are *substitutes* in *highly developed countries*.
- (2) The shadow economy and corruption are *complements* in *developing countries*.

➔ *Empirical evidence is again very mixed.*

## **2. Theoretical Considerations**

### **2.2 Theoretical considerations about the shadow economy and *corruption***

**What are the main causes of corruption?**

***(i) Quality of political and judicial indicators***

**The lower the quality of the political system and policy formation and the lower the respect for the rule of law, the higher is the level of corruption, *ceteris paribus*.**

***(ii) Social and cultural indicators***

**The lower the primary school enrolment rate, the higher the level of corruption, *ceteris paribus*.**

## **2. Theoretical Considerations**

### **2.2 Theoretical considerations about the shadow economy and *corruption***

**What are the main causes of corruption (cont.)?**

***(iii) Economic causes***

**The more significant the role of the public sector, the higher the level of corruption, *ceteris paribus*.**

**The lower economic freedom – i.e. the higher the level of government interference – the higher is the level of corruption, *ceteris paribus*.**

## **2. Theoretical Considerations**

### **2.2 Theoretical considerations about the shadow economy and *corruption***

**What are the main indicators of corruption?**

**(i) *GDP per capita***

**The higher the level of corruption, the lower is the level of economic development – as measured by per capita GDP, *ceteris paribus*.**

**(ii) *Index of bribes and extra payments***

**Taken from responses to the question: “In your industry, how commonly would you estimate that firms make undocumented extra payments or bribes?”**

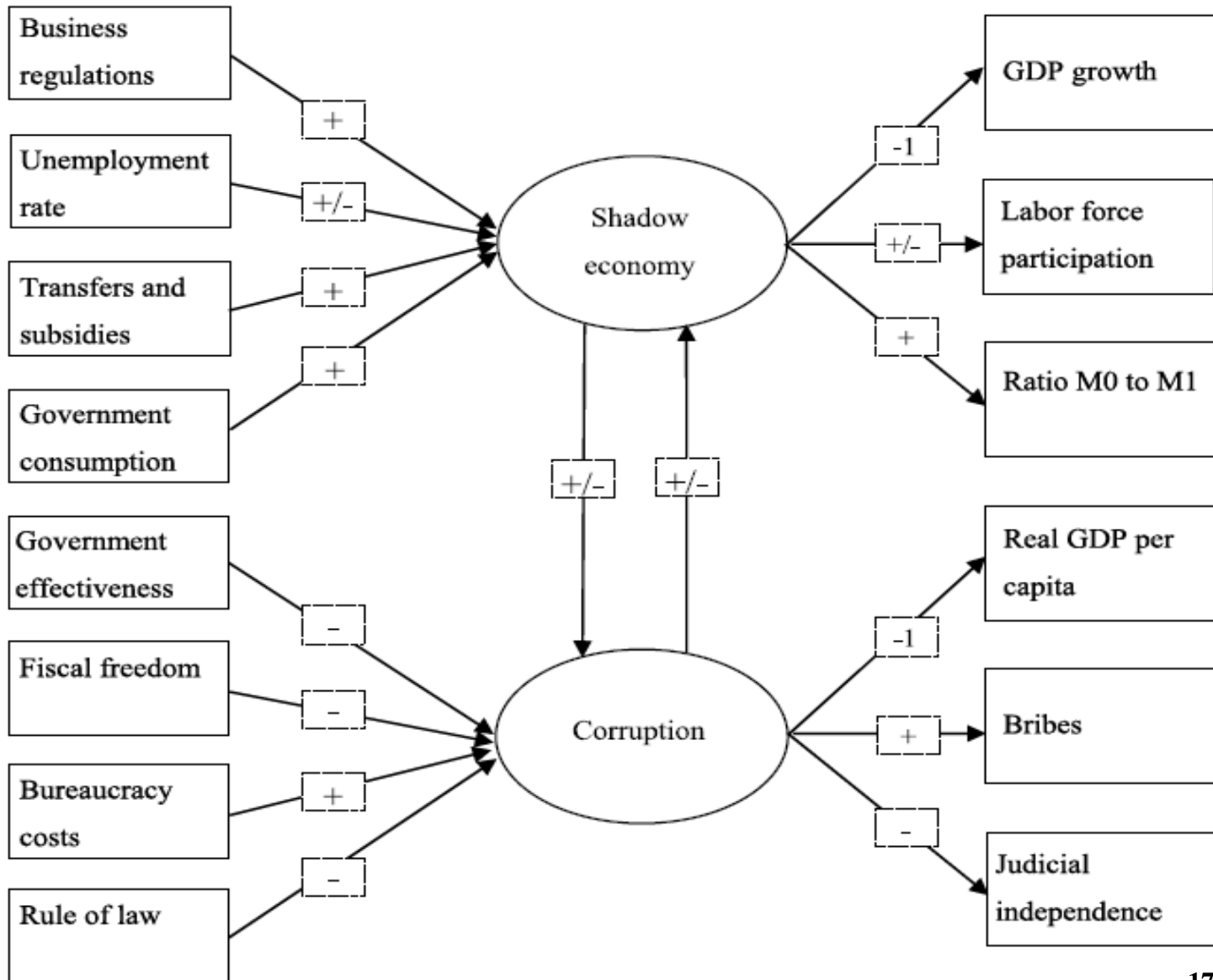
**Positive correlation between this index and corruption, *ceteris paribus*.**



## 2. Theoretical Considerations

### 2.3 Path diagram of the shadow economy and of corruption

Figure 2.2: Path diagram of the benchmark model



### 3. Estimation and Size of the Shadow Economies in Italy and in Other OECD Countries – 3.1 Estimation procedure

#### (1) 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:  $\eta = \gamma x + \zeta$ .

Link between the latent variable and its indicators is represented in the measurement model:  $y = \lambda \eta + \varepsilon$ .

$\eta$ : latent variable (shadow economy)

$x$ :  $q$  vector of causes in the structural model

$y$ :  $p$  vector of indicators in the measurement model

$\gamma$ :  $q$  vector of coefficient of the causes in the structural model

$\lambda$ :  $p$  vector of coefficient in the measurement model

$\zeta, \varepsilon$ : error terms in the structural model and the measurement model, respectively

### 3. Estimation and Size of the Shadow Economies in Italy and in Other OECD Countries – 3.1 Estimation procedure

#### (1) MIMIC Estimation Procedure (cont.):

##### ➤ Specification of structural equation:

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

##### ➤ Specification of measurement equation:

$$\begin{array}{|l} \text{Employment quota} \\ \text{Change of local currency} \\ \text{Official GDP growth} \end{array} = \begin{array}{|l} \lambda_1 \\ \lambda_2 \\ \lambda_3 \end{array} \cdot \begin{array}{c} \text{Shadow} \\ \text{Economy} \end{array} + \begin{array}{|l} \varepsilon_1 \\ \varepsilon_2 \\ \varepsilon_3 \end{array}$$

### **3. Estimation and Size of the Shadow Economies in Italy and in Other OECD Countries – 3.1 Estimation procedure**

#### **(2) Problems and Critique of the MIMIC Method:**

- (i) When applying the MIMIC method, there is no clear division between *causal* variables, which directly influence (drive) the shadow economy and *indicator* variables, in which shadow economy activities are reflected. Hence one *caveat* of the MIMIC method is, that there is not a *theoretically oriented guiding rule* which are indicator and which are causal variables.**
- (ii) A further disadvantage of the MIMIC procedure is that it “produces” only relative estimates of the size of the shadow economy.**
- (iii) Estimation results are quite often not robust.**

### 3. Estimation and Size of the Shadow Economies in Italy and in Other OECD Countries – 3.2 Econometric results

**Table 3.1: MIMIC model estimations (standardized coefficients)**

Specification	1	2
<i>Causes</i>		
<b>Personal income tax</b>	<b>0.40***</b> (4.80)	<b>0.39***</b> (4.74)
<b>Indirect taxes</b>	<b>0.21***</b> (2.67)	<b>0.24***</b> (2.97)
<b>Tax morale</b>	<b>-0.22***</b> (2.51)	<b>-0.21***</b> (2.38)
<b>Unemployment</b>	<b>0.55***</b> (5.56)	<b>0.53***</b> (5.47)
<b>Business freedom</b>	<b>-0.35***</b> (4.06)	<b>-0.35***</b> (4.20)
<b>Self-employment</b>	<b>0.33***</b> (3.18)	<b>0.27***</b> (2.57)
<b>Rule of Law</b>	<b>-0.08</b> (1.03)	-
<b>GDP growth</b>	<b>-0.27***</b> (3.35)	<b>-0.29***</b> (3.52)
<b>Education</b>	<b>-0.31***</b> (3.51)	<b>-0.26***</b> (2.83)
<b>Corruption</b>	-	<b>0.14</b> (1.56)

### 3. Estimation and Size of the Shadow Economies in Italy and in Other OECD Countries – 3.2 Econometric results

**Table 3.1: MIMIC model estimations (standardized coefficients) (cont.)**

Specification	1	2
<i>Indicators</i>		
<b>GDP pc</b>	<b>-0.51</b>	<b>-0.50</b>
<b>Currency in circulation</b>	<b>0.10*</b> (1.69)	<b>0.08</b> (1.26)
<b>Labour force participation</b>	<b>-0.50***</b> (6.48)	<b>-0.51***</b> (6.46)
<b>Observations</b>	<b>151</b>	<b>151</b>
<b>Degrees Freedom</b>	<b>52</b>	<b>52</b>
<b>Chi-square</b>	<b>32.51</b>	<b>34.57</b>
<b>RMSEA</b>	<b>0.00</b>	<b>0.00</b>

Note: The sample includes 39 OECD countries and the estimation period is 1998 to 2010. Absolute z-statistics are reported in parentheses. \*, \*\*, \*\*\* indicate significance at the 10%, 5%, and 1% level, respectively.

Source: Schneider and Buehn (2012), p. 17.

### 3. Estimation and Size of the Shadow Economies in Italy and in Other OECD Countries – 3.2 Econometric results

**Table 3.2: Estimation results for the shadow economy and corruption**

Specification (1)	Shadow Economy	Corruption
<i>Causes</i>		
<b>Business regulations</b>	<b>0.18**</b> <b>(2.00)</b>	
<b>Unemployment</b>	<b>0.19**</b> <b>(1.98)</b>	
<b>Transfers and subsidies</b>	<b>0.09</b> <b>(1.16)</b>	
<b>Government consumption</b>	<b>0.16**</b> <b>(1.98)</b>	
<b>Government effectiveness</b>		<b>-0.22***</b> <b>(3.13)</b>
<b>Fiscal freedom</b>		<b>-0.15***</b> <b>(2.48)</b>
<b>Bureaucracy costs</b>		<b>0.42***</b> <b>(5.15)</b>
<b>Rule of law</b>		<b>-0.01</b> <b>(0.10)</b>

Note: Absolute z-statistics are reported in parentheses. \*, \*\*, \*\*\* indicate significance at the 10%, 5%, and 1% level, respectively.  
Source: Schneider and Buehn (2012), pp. 187-187.

**Table 3.2: Estimation results for the shadow economy and corruption (cont.)**

Specification (1)	Shadow Economy	Corruption
<i>Indicators</i>		
GDP-growth	-0.51	
Labor force participation	-0.41*** (4.15)	
Ratio M0 to M1	0.31*** (3.33)	
Real GDP per capita		-0.78
Bribes		0.15* (1.73)
Judicial independence		-0.06 (0.73)
<i>Relationship between the latent variables</i>		
Shadow economy → corruption		0.68*** (4.23)
Corruption → shadow economy		0.42*** (2.64)
Observations		168
Chi-square (p-value)		97.23 (0.11)
RMSEA		0.04
AGFI		0.90

Note: Absolute z-statistics are reported in parentheses. \*, \*\*, \*\*\* indicate significance at the 10%, 5%, and 1% level, respectively.

Source: Schneider and Buehn (2012), pp. 187-187.



### 3. Estimation and Size of the Shadow Economies in Italy and in Other OECD Countries – 3.3 Summary

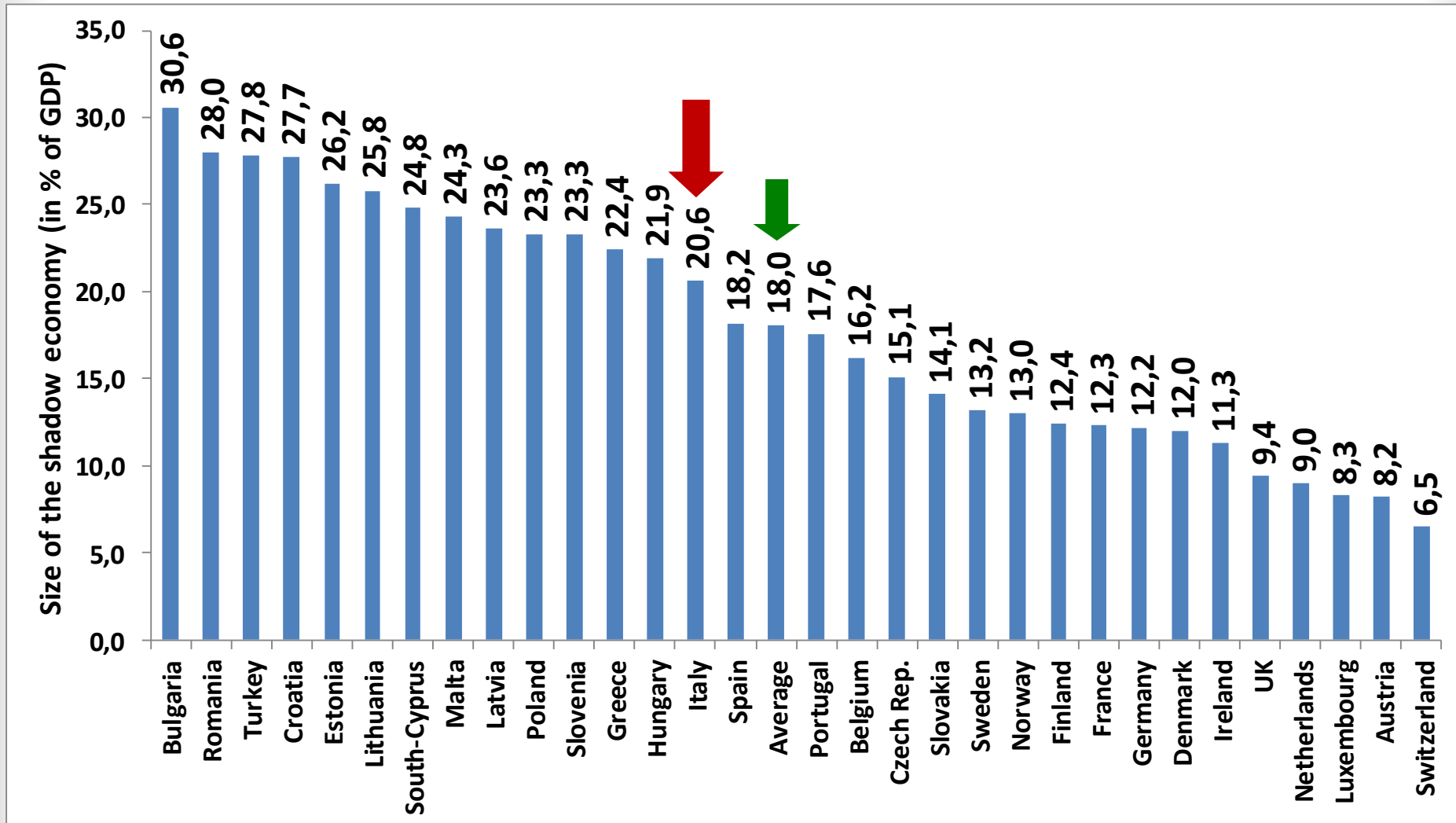
Table 3.3: Summary of the empirical findings

Short description	Empirical finding
<b><i>Shadow economy</i></b>	
A higher <i>tax burden</i> increases the shadow economy.	Confirmed
More <i>regulation</i> increases the shadow economy.	Confirmed
The larger the shadow economy, the more <i>cash</i> circulates.	Confirmed
The larger the shadow economy, the smaller <i>growth</i> in the official economy.	Assumed (fixed indicator for the shadow economy)
<b><i>Corruption</i></b>	
The lower the <i>quality of the political system</i> and policy formulation and the lower the respect for the <i>rule of law</i> , the higher the level of corruption, <i>ceteris paribus</i> .	Partly confirmed
The lower <i>primary school enrolment rates</i> , the higher level of corruption.	Not confirmed
The lower the <i>economic freedom</i> , the higher the level of corruption.	Confirmed
The higher the level of corruption, the lower the level of <i>economic development</i> .	Assumed (fixed indicator for corruption)

Source: Schneider and Buehn (2012), pp. 187-187.

### 3. Estimation and Size of the Shadow Economies in Italy and in Other OECD Countries – 3.4 Results of the size of the shadow economy

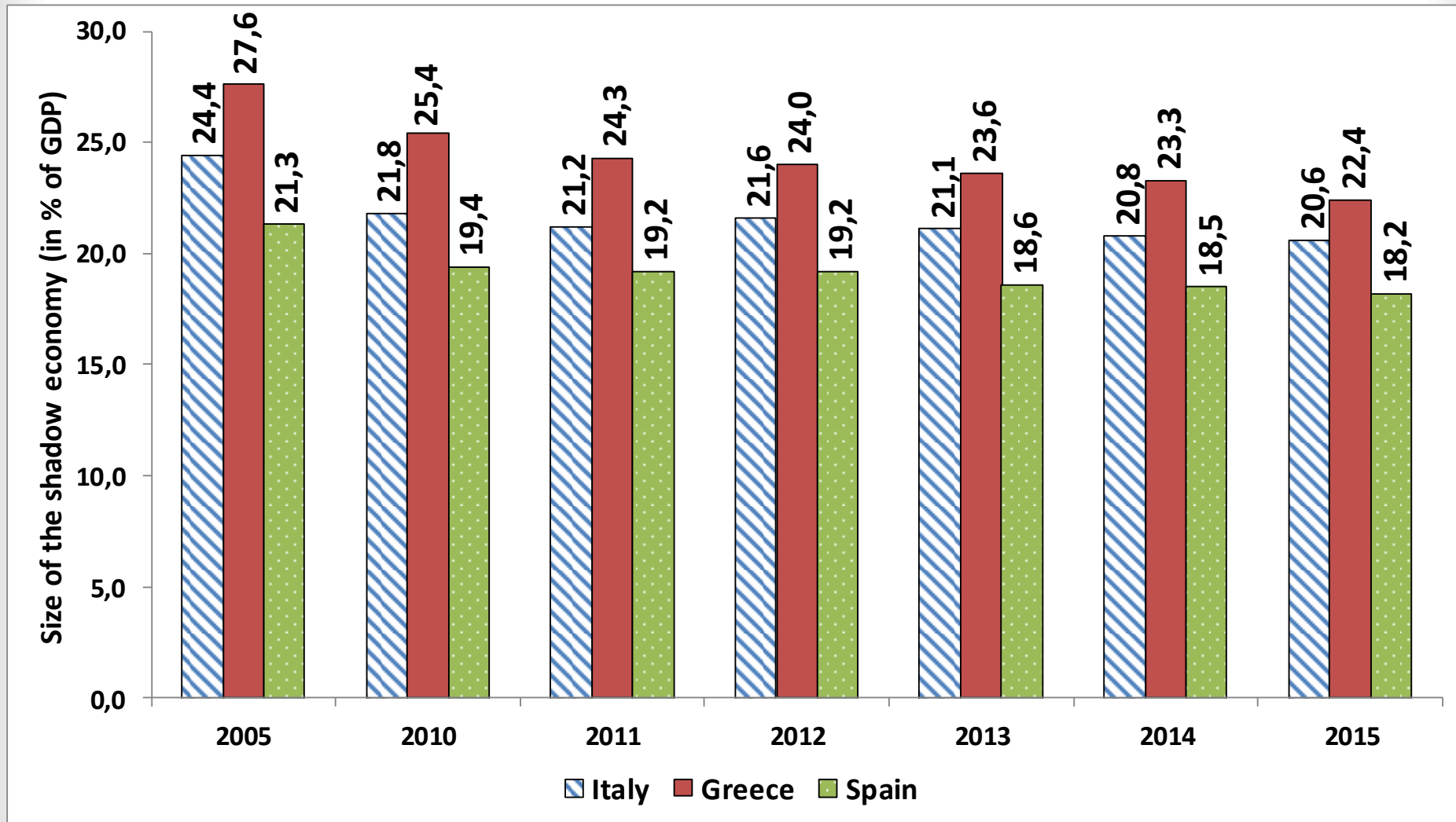
Figure 3.1: Size of the shadow economy of 31 European countries in 2015 (forecast)



Source: own calculations, January 2015.

### 3. Estimation and Size of the Shadow Economies in Italy and in Other OECD Countries – 3.4 Results of the size of the shadow economy

Figure 3.2: Shadow economy of Italy, Spain and Greece from 2005-2015 (in % of GDP)



Source: own calculations, January 2015.

### 3. Estimation and Size of the Shadow Economies in Italy and in Other OECD Countries – 3.4 Results of the size of the shadow economy

**Table 3.4: Average standardized relative impact (in %) of the shadow economy determinants in 4 OECD countries from 1999 to 2010**

Country/ Factor	Average size of the shadow economy	Personal income tax	Indirect taxes	Tax morale	Un- employ- ment	Self- employ- ment	GDP growth	Business freedom
Greece	27,0	10,3	16,2	14,5	10,4	18,7	14,3	15,5
<i>Italy</i>	<i>26.9</i>	<i>13.0</i>	<i>13.9</i>	<i>14.0</i>	<i>14.5</i>	<i>14.0</i>	<i>16.6</i>	<i>13.9</i>
Portugal	22.7	12.5	14.1	14.9	14.2	14.4	15.9	14.1
Spain	22.8	11.2	13.6	14.6	17.5	16.4	13.8	12.9
<i>Average over 38 OECD countries</i>	<i>20,3</i>	<i>13,8</i>	<i>14,1</i>	<i>14,5</i>	<i>14,6</i>	<i>14,6</i>	<i>14,3</i>	<i>14,2</i>

Source: Schneider and Buehn (2012), p. 25.

### 3. Estimation and Size of the Shadow Economies in Italy and in Other OECD Countries – 3.4 Results of the size of the shadow economy

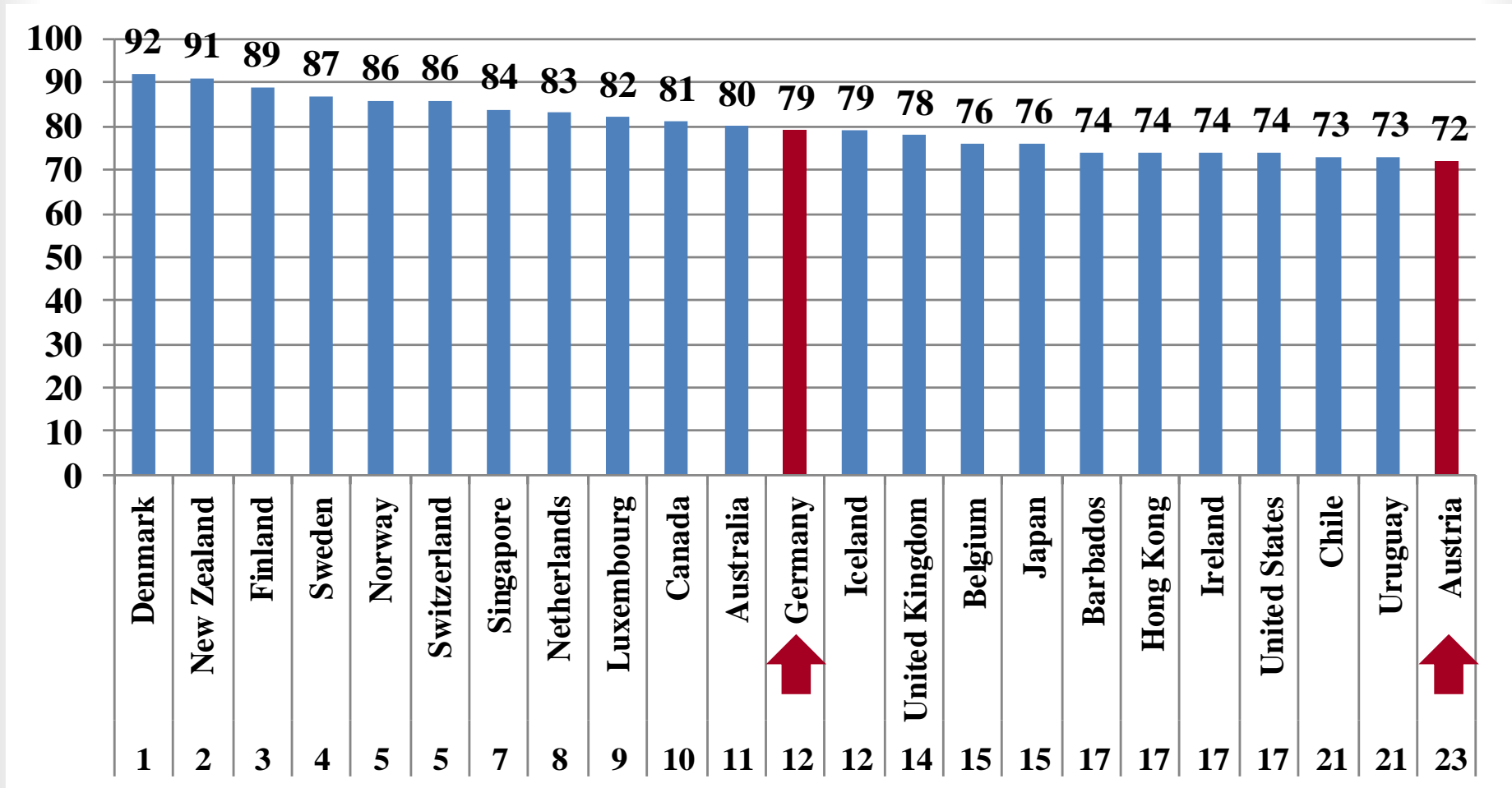
Figure 3.3: Average standardized relative impact (in %) of the shadow economy determinants in 4 OECD countries from 1999 to 2010



Source: Buehn and Schneider (2013), pp. 17-18, and own calculations.

# 4. The Effects of Corruption on the Official Economy

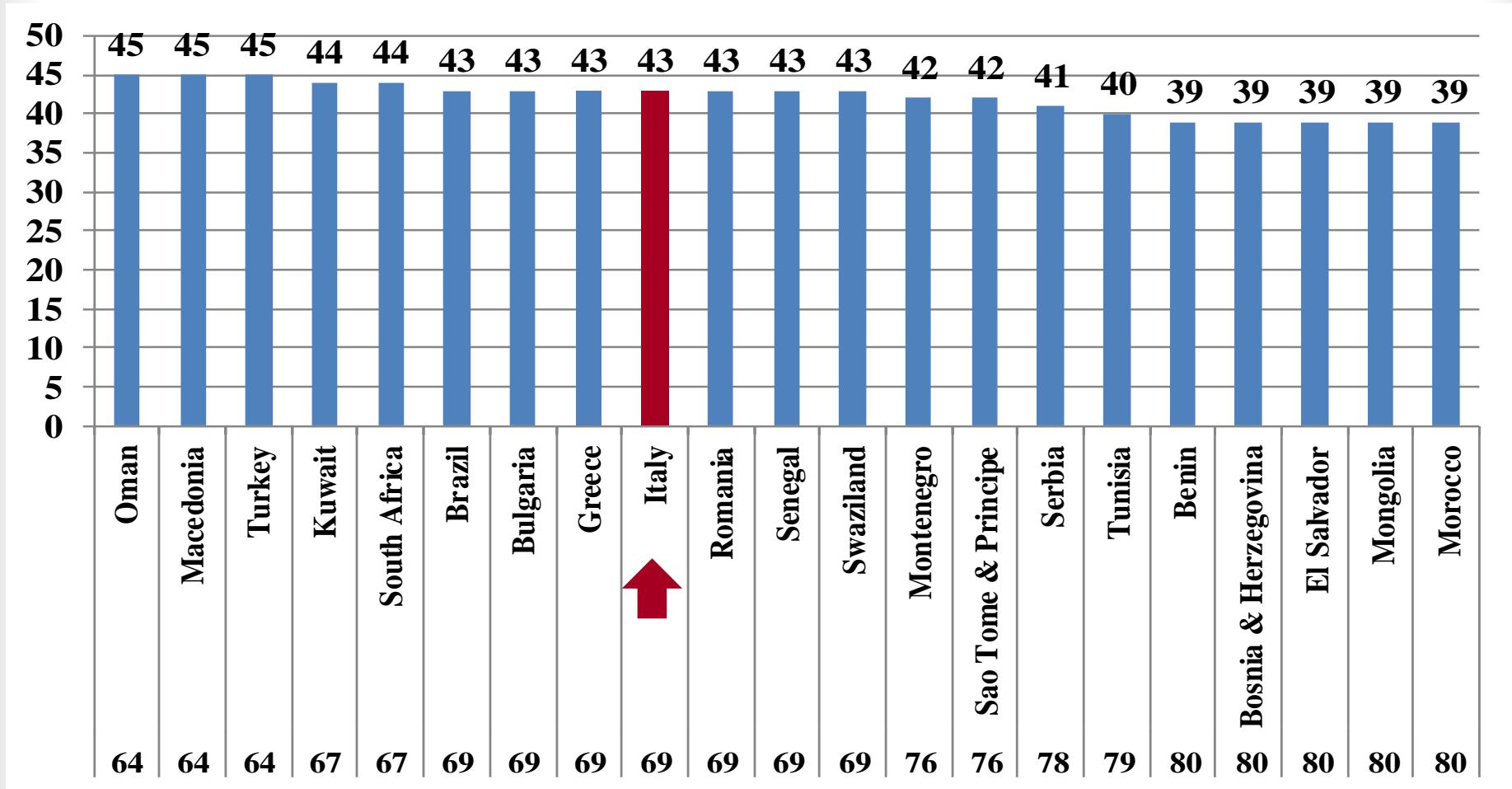
Figure 4.1: The extent of corruption in the year 2014 – the 23 countries with the lowest corruption



Source: Transparency International, Berlin, 2014.

# 4. The Effects of Corruption on the Official Economy

Figure 4.2: The extent of corruption in the year 2014 – position of Italy: rank 69 with a score of 43!



Source: Transparency International, Berlin, 2014.

## 4. The Effects of Corruption on the Official Economy

**Table 4.1: Development of corruption and its damage to the *Italian* economy over 2004 to 2014<sup>1)</sup>**

Variable	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Damage in billion euros <sup>1)</sup>	<b>152</b>	<b>150</b>	<b>159</b>	<b>156</b>	<b>172</b>	<b>185</b>	<b>208</b>	<b>212</b>	<b>194</b>	<b>189</b>	<b>190</b>
CPI Corruption Transparency Index <sup>2)</sup>	<b>48</b>	<b>50</b>	<b>49</b>	<b>52</b>	<b>48</b>	<b>43</b>	<b>39</b>	<b>39</b>	<b>42</b>	<b>43</b>	<b>43</b>
Rank of Italy <sup>2)</sup>	<b>42</b>	<b>40</b>	<b>45</b>	<b>41</b>	<b>55</b>	<b>63</b>	<b>67</b>	<b>69</b>	<b>72</b>	<b>69</b>	<b>69</b>

1) Economic Damage = reduced GNP caused by corruption; own calculations, May 2015. GDP figures used for calculation

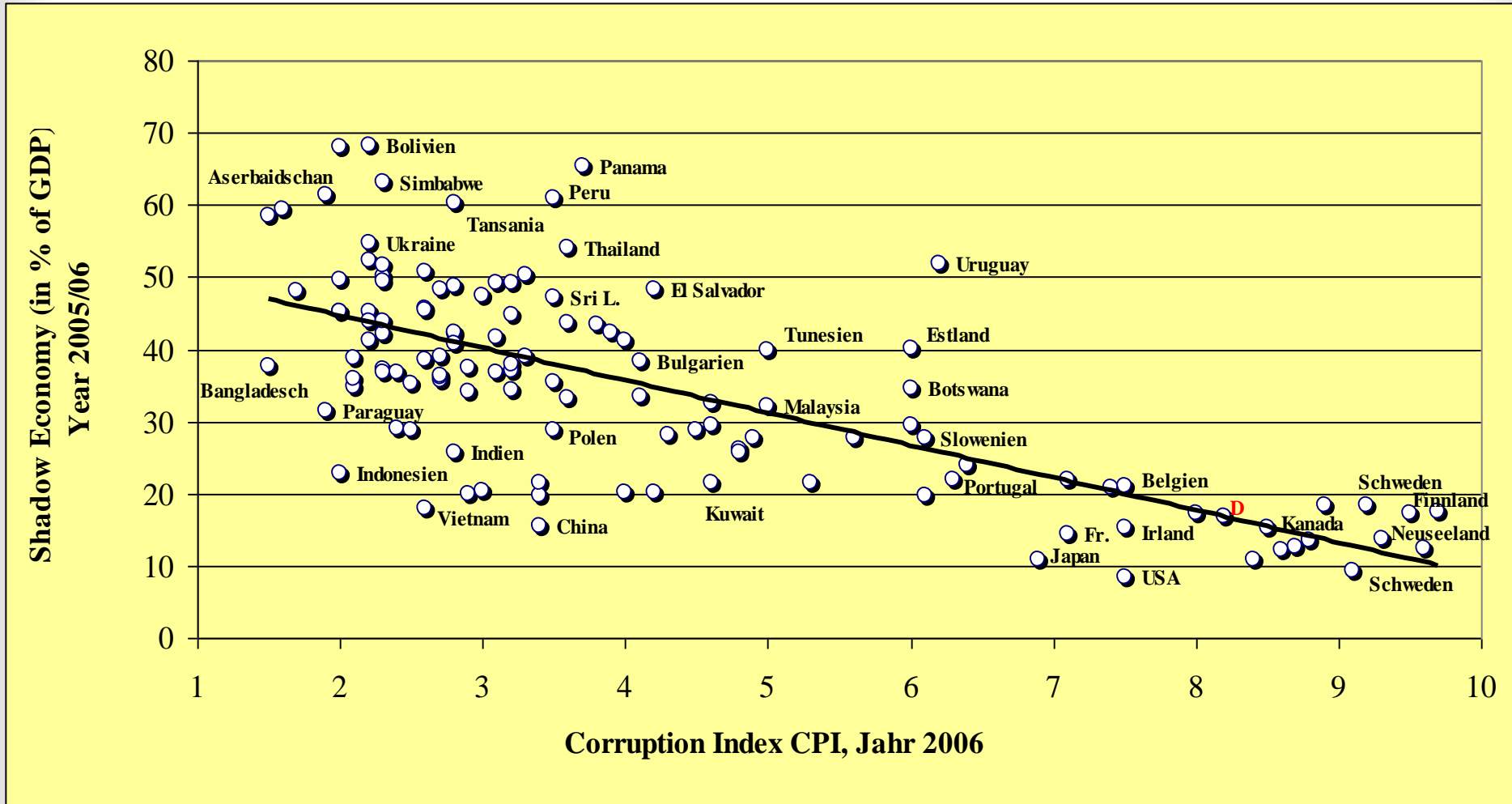
Source of GDP figures used for the calculations: IMF World Economic Outlook Database, April 2015.

2) Source: CPI Transparency (Value 100=no corruption, Value 0=highest possible corruption), Berlin, 2014.



# 4. The Effects of Corruption on the Official Economy

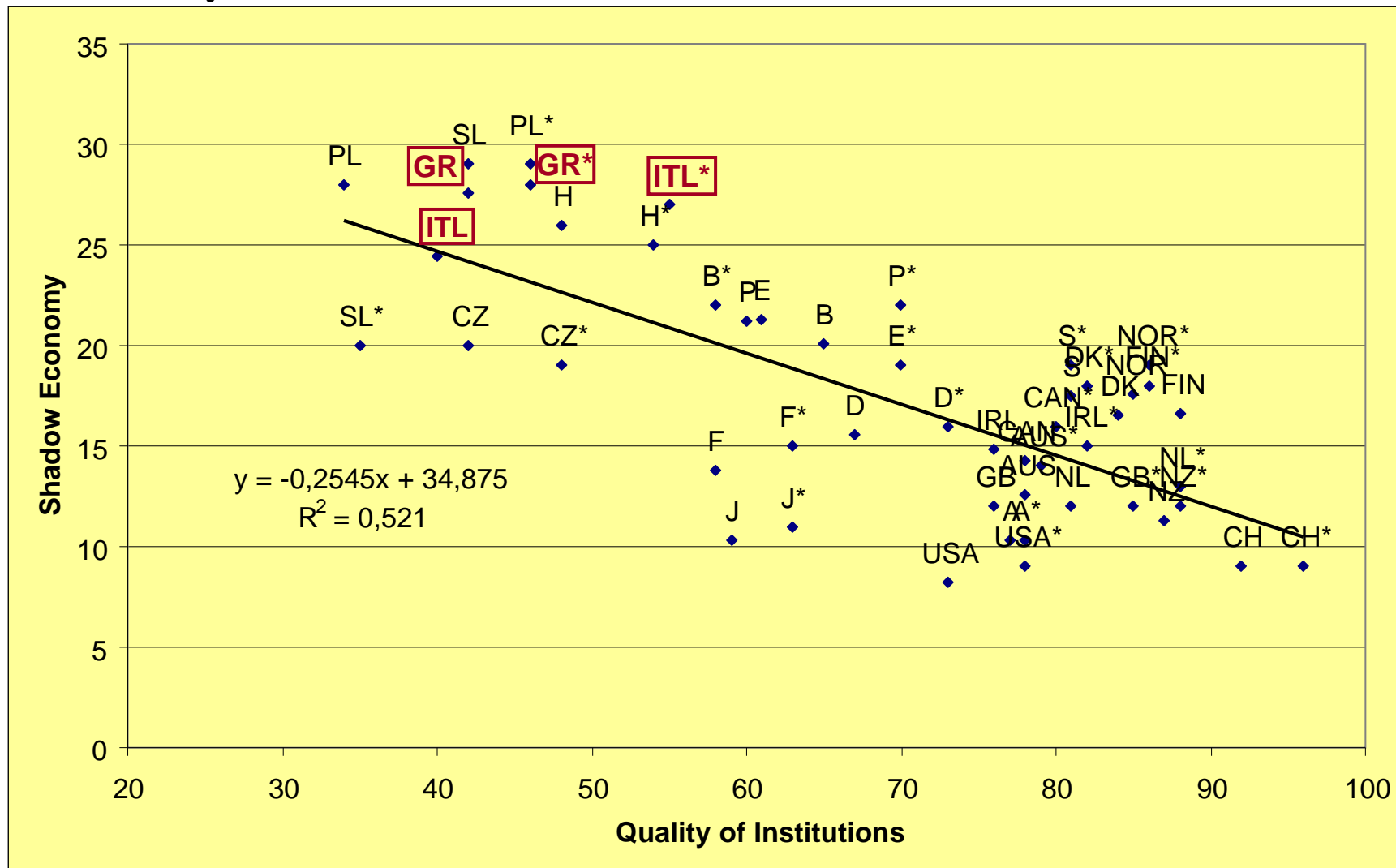
Figure 4.3: The interaction between shadow economy and corruption, year 2006



Quelle: Thum (2005).

# 4. The Effects of Corruption on the Official Economy

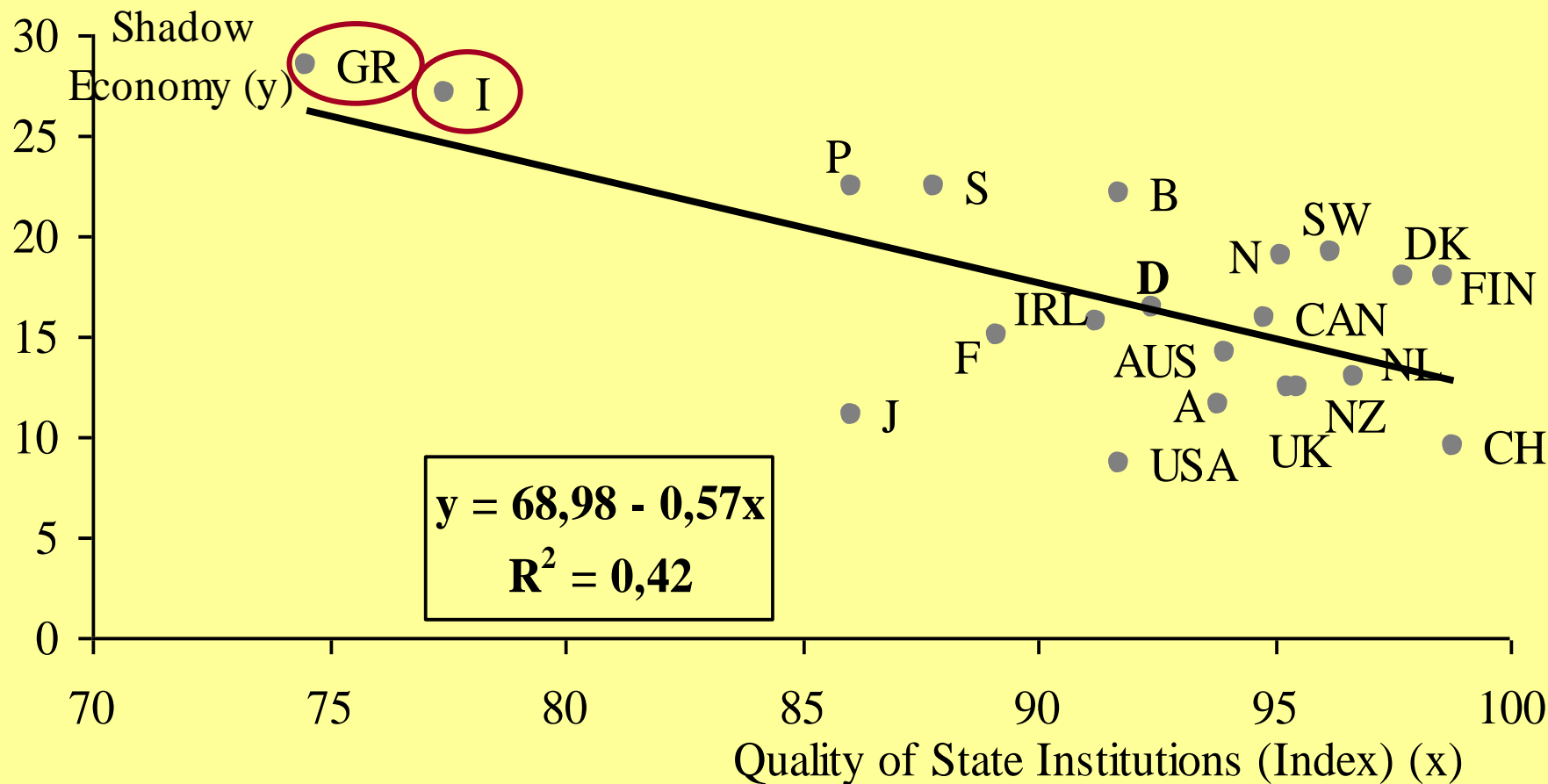
Figure 4.4: Quality of State Institutions <sup>1)</sup> and size of the shadow economy – averages over the years 1995-2000 and 2001-2005



1) Governance Index of the Worldbank; 0 = lowest; 100 = highest quality of state (public) institutions. Source: Worldbank, 2003; Schneider, 2003; Enste, 2003, with new calculations.

## 4. The Effects of Corruption on the Official Economy

Figure 4.5: Quality of State Institutions and the Size of the Shadow Economy – Index, measuring the Quality of State Institutions<sup>1)</sup> and shadow economy in percent of official GDP, year 2002<sup>2)</sup>



1) Governance-Index of the Worldbank; 0=lowest quality and 100=highest quality of state institutions. Source: Worldbank, 2003; Schneider, 2003 and Enste (2003).

2) Size of the shadow economy, calculated with the help of the DYMIMC and currency demand method.

# **5. Policy Measures to Reduce the Shadow Economy and Corruption**

## ***5.1 Shadow economy***

- (1) To reimburse the VAT on labor intensive services (the so-called Luxemburg Model) in order to strengthen the incentive to supply those services in the official economy.**
- (2) Household investments (e.g. in Germany 1.200 euros per household per year) should be tax deductible; hence, if you need a bill, you cannot do it in the shadow economy.**

# 5. Policy Measures to Reduce the Shadow Economy and Corruption

## 5.1 Shadow economy (cont.)

- (3) The use of the policy instruments of (increased) punishment and detection rates should be applied in special areas where the shadow economy activities are connected with organized crime (e.g. the case of prostitution).**
  
- (4) Decrease of the burden of taxes and social security payments as part of the wage costs.**

# 5. Policy Measures to Reduce the Shadow Economy and Corruption

## 5.2 Corruption

A successful fight against *corruption* is the third big policy challenge for the Italian government – four measures:

- (1) Firms which provide bribes and/or are corrupt should be banned from public contracting for 3-5 years.
- (2) Whistle blowing (blowers) should be actively supported by government institutions. (Monetary) incentives should be installed for the detection of corruption.
- (3) Public employees and politicians should immediately lose their offices and pension rights if they take bribes.
- (4) Strict compliance measures should be installed.

# 5. Policy Measures to Reduce the Shadow Economy and Corruption

## 5.3 *What did we learn?*

- (1) Our findings reveal that a large shadow economy is linked to high levels of corruption.**
- (2) In countries with large shadow economies, firms and individuals often rely to a large extent on shadow economy activities.**
- (3) In order to avoid detection, taxation, and punishment, they bribe bureaucrats.**
- (4) Low tax revenues reduce the quality of public services and infrastructure. This in turn reduces the incentives to remain in the official economy.**

# 5. Policy Measures to Reduce the Shadow Economy and Corruption

## 5.3 *What did we learn (cont.)?*

- (5) Weaker legal systems and unstable conditions for economic activity increase corruption. Acting like an extra tax, corruption drives individuals underground.**
- (6) A shrinking shadow economy due to lower taxes and less regulation reduces people incentives either for being corrupt or to bribe their fellows.**
- (7) Realizing that the government provides good services and well functioning institutions in exchange for their tax payments, they honor the implicit contract with the government.**



# 5. Policy Measures to Reduce the Shadow Economy and Corruption

## 5.3 *What did we learn (cont.)?*

- (8) We have only first and not robust insights of the interaction of the shadow economy and corruption.**
- (9) Additionally, we have first and preliminary results of the damage of corruption in four OECD countries.**
- (10) We did learn something, but certainly not enough.**

**Thank you very much for your  
attention!**

## **6. Appendix A.1: Estimating the Shadow Economy**

### **MIMIC Estimation and Calibration Procedure:**

- (i) The estimation of absolute values of the shadow economy is based on a combination of the MIMIC procedure and the currency demand method.**
- (ii) This requires an additional procedure so called benchmarking or calibration procedure. Unfortunately, no consensus exists in the literature which benchmarking procedure to use.**

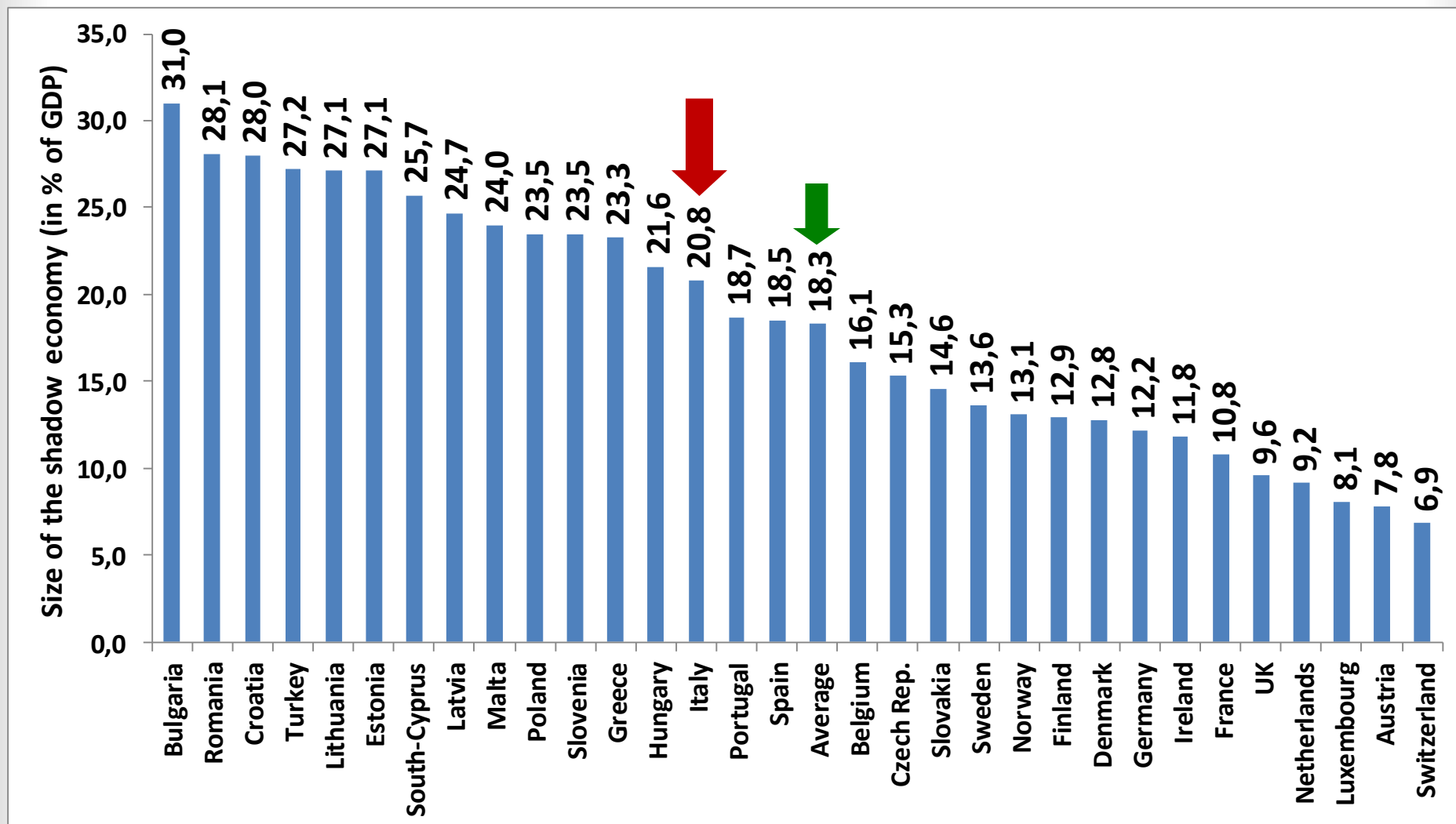
## 6. Appendix A.1: Estimating the Shadow Economy

### MIMIC Estimation and Calibration Procedure (cont.):

- (iii) In the *first step*, the MIMIC model index of the shadow economies is calculated using the structural equation, i.e., by multiplying the coefficients of the significant causal variables with the respective time series.
- (iv) In a *second step* this index is converted into absolute values of the shadow economy taking base values for a particular year; e.g. from a currency demand approach.

## 6. Appendix A.2: The Size of the Shadow Economy in Some European Countries in 2014

Figure A.1: Size of the shadow economy of 31 European countries in 2014 (in % of GDP)



Source: own calculations, January 2014.

## 6. Appendix A.3: The Development of Corruption in Greece, Austria and Germany

**Table A.1: Development of corruption and its damage to the *Greek* economy over 2004 to 2014<sup>1)</sup>**

Variable	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
<b>Damage in billion euros<sup>1)</sup></b>	<b>23</b>	<b>23</b>	<b>25</b>	<b>26</b>	<b>26</b>	<b>31</b>	<b>33</b>	<b>31</b>	<b>27</b>	<b>23</b>	<b>21</b>
<b>CPI Corruption Transparency Index<sup>2)</sup></b>	<b>43</b>	<b>43</b>	<b>44</b>	<b>46</b>	<b>47</b>	<b>38</b>	<b>35</b>	<b>34</b>	<b>36</b>	<b>40</b>	<b>43</b>
<b>Rank of Greece<sup>2)</sup></b>	<b>49</b>	<b>47</b>	<b>54</b>	<b>56</b>	<b>57</b>	<b>71</b>	<b>78</b>	<b>80</b>	<b>94</b>	<b>80</b>	<b>69</b>

1) Economic Damage = reduced GNP caused by corruption; own calculations, May 2015. GDP figures used for calculation

Source of GDP figures used for the calculations: IMF World Economic Outlook Database, April 2015.

2) Source: CPI Transparency (Value 100=no corruption, Value 0=highest possible corruption), Berlin, 2014.

## 6. Appendix A.3: The Development of Corruption in Greece, Austria and Germany

**Table A.2: Development of corruption and its damage to the *Austrian* economy over 2004 to 2014<sup>1)</sup>**

Variable	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
<b>Damage in billion euros<sup>1)</sup></b>	<b>11</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>	<b>14</b>	<b>14</b>	<b>15</b>	<b>18</b>	<b>18</b>	<b>18</b>
<b>CPI Corruption Transparency Index<sup>2)</sup></b>	<b>84</b>	<b>87</b>	<b>86</b>	<b>81</b>	<b>81</b>	<b>79</b>	<b>79</b>	<b>78</b>	<b>69</b>	<b>69</b>	<b>72</b>
<b>Rank of Austria<sup>2)</sup></b>	<b>13</b>	<b>10</b>	<b>11</b>	<b>13</b>	<b>12</b>	<b>16</b>	<b>15</b>	<b>16</b>	<b>25</b>	<b>26</b>	<b>23</b>

1) Economic Damage = reduced GNP caused by corruption; own calculations, May 2015. GDP figures used for calculation

Source of GDP figures used for the calculations: IMF World Economic Outlook Database, April 2015.

2) Source: CPI Transparency (Value 100=no corruption, Value 0=highest possible corruption), Berlin, 2014.

## 6. Appendix A.3: The Development of Corruption in Greece, Austria and Germany

**Table A.3: Development of corruption and its damage to the *German* economy over 2004 to 2014<sup>1)</sup>**

Variable	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
<b>Damage in billion euros<sup>1)</sup></b>	<b>117</b>	<b>118</b>	<b>126</b>	<b>136</b>	<b>137</b>	<b>130</b>	<b>138</b>	<b>142</b>	<b>147</b>	<b>152</b>	<b>155</b>
<b>CPI Corruption Transparency Index<sup>2)</sup></b>	<b>82</b>	<b>82</b>	<b>80</b>	<b>78</b>	<b>79</b>	<b>80</b>	<b>79</b>	<b>80</b>	<b>79</b>	<b>78</b>	<b>79</b>
<b>Rank of Germany<sup>2)</sup></b>	<b>15</b>	<b>16</b>	<b>16</b>	<b>16</b>	<b>14</b>	<b>14</b>	<b>15</b>	<b>14</b>	<b>13</b>	<b>12</b>	<b>12</b>

1) Economic Damage = reduced GNP caused by corruption; own calculations, May 2015. GDP figures used for calculation

Source of GDP figures used for the calculations: IMF World Economic Outlook Database, April 2015.

2) Source: CPI Transparency (Value 100=no corruption, Value 0=highest possible corruption), Berlin, 2014.