

CONSIDERATIONS ON THE DISTRIBUTION OF INFORMAL ECONOMY IN THE EUROPEAN UNION

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Abstract

Informal economy is a ubiquitous element in both developed and emerging states. Given the complex nature of the concept and the multitude of forms in which it can be found, modeling informal economy became an important focus in the specific scientific literature. This paper aims to advance a graphical representation of the correlation between income per capita and informal economic in Europe. Building on this analysis, the paper brings forth a model that simulates the variation of informal economy as a function of the dynamics of GDP per capita.

Keywords: Informal Economy, Economic Growth, Spatial Distribution

JEL Classification: E26

1. Introduction

Last decades, there are many studies trying to estimate both the size and dynamics of informal economy. Generally, the informal economy refers to activities and income being partially or fully outside government regulation, taxation, and observation.

For instance, from the on line Business Dictionary, the informal economy is viewed as “System of trade or economic exchange used outside state controlled or money based transactions. Practiced by most of the world's population, it includes barter of goods and services, mutual self-help, odd jobs, street trading, and other such direct sale activities. Income generated by the informal economy is usually not recorded for taxation purposes, and is often unavailable for inclusion in gross domestic product (GDP) computations” (see for details <http://www.businessdictionary.com/>). A typical worker operating in informal economy: “has no formal contract with his employer; has no systematic work conditions; gets irregularly

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and unevenly paid; has no forum to express his grievances; has no fixed hours of work and mostly earns hand to mouth; is not covered by any kind of social security system; and has poor knowledge about the need to protect himself socially and economically.”

Moreover, some of them are studying the impact of such type of activity on the general process of economic growth. Depending on its definition and on the method of estimation, to denote informal economy there is a huge number of names: underground economy, shadow economy, hidden economy, gray economy, parallel economy, etc. (Feige, 1989; Fortin and Lacroix, 1994; Gibson and Kelley, 1994; Gutmann, 1977; Schneider, 2013; ILO, 2012; Kuehn, 2007; Porta and Shleifer, 2014; OECD, 2002 and 2009; Tanzi, 1982; Thomas, 1992).

In this study, we present graphically (by using stylized maps of Europe) the inverse correlation between income per capita and informal economy in Europe. Then, based on the analyse of the dynamics of informal economy during a decade in EU we estimated a model that can be useful to simulate how the size of informal economy will change in correlation with the dynamics of GDP per capita.

2. Spatial distribution of informal economy in Europe and correlations

In order to analyse the trend in dynamics of the correlation between the size of informal economy and growth in Europe, it is useful to see how their geographical distribution (presented here as a stylised map of Europe) changed during a medium or long term. For instance, from Figures 1 and 2 (where LO and LA are longitude and respectively latitude) we can see that both in 2003 and in 2012 the distribution of informal economy in Europe (30 countries: 28 EU countries plus Norway and Switzerland) looks like in a mirror comparing to the distribution of GDP per capita. Data used to build the stylised maps are from Schneider (2013) on shadow economy, and from IMF (International Monetary Fund, World Economic Outlook Database, April 2015) on GDP. On the stylised maps of Europe, y means GDP per capita, expressed in thousand dollars per person at Purchasing Power Parity (PPP), and z is the size of the shadow economy (as percent of official GDP).

In 2003 and in 2012 the estimated values of correlation coefficient (between GDP per capita and the size of informal economy) were -0.757 and respectively -0.764.

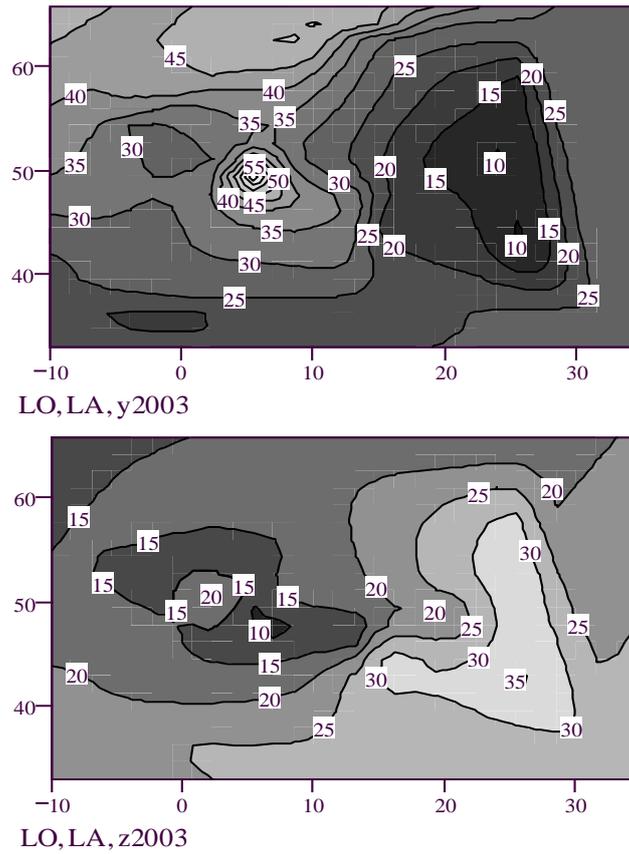


Figure 1

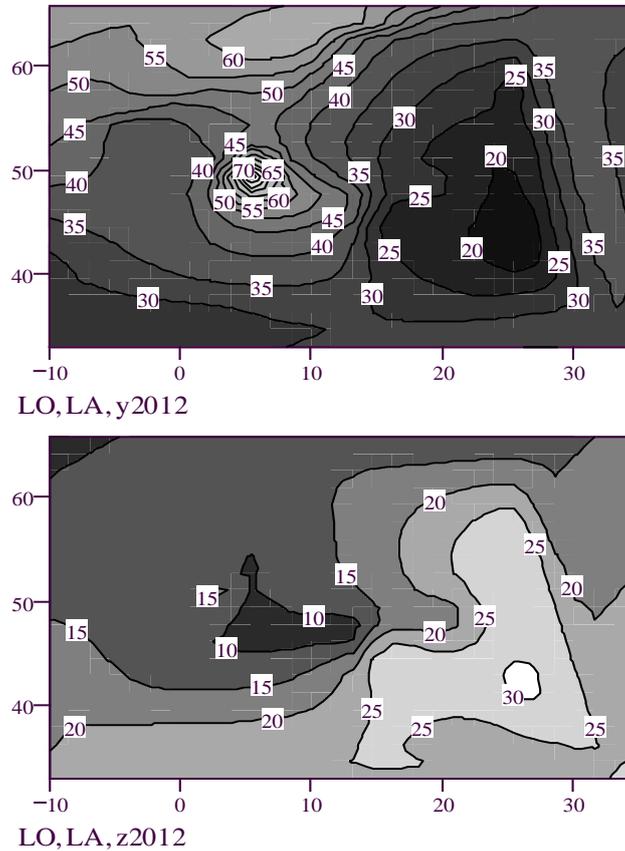


Figure 2

Moreover, already there is in specialised literature a general rule asserting that an inverse correlation between the level of economic development and the size of informal economy exists. This rule could be illustrated in case of the selected 30 European countries, as it is shown in Figure 3, where the EU countries plus Norway and Switzerland were considered for the period 2003-2012. The graphical representation is based also on the estimated data for informal (shadow) economy from Schneider (2013).

In Figure 3, y is GDP per capita (expressed in thousand dollars per person at Purchasing Power Parity, PPP), z - the size of the shadow economy (as percent of GDP), i - countries, and t - years. On the graphical representation in this Figure, Romania is

represented in 2003 and respectively in 2012 by the two points noted as (yR2003, zR2003) and respectively (yR2012, zR2012).

The corresponding correlation between GDP per capita and the size of informal economy for the selected European countries in the period 2003-2012 was strongly negative (the value of correlation coefficient was -0.755). For the considered period, the correlation coefficient (between y and z) was lower than -0.9 for all countries, excepting Greece (-0.540), Luxemburg (-0.758), Malta (-0.854), Ireland (-0.862), and Cyprus (-0.877).

Moreover, by adding informal economy to the official GDP, we can estimate the total GDP per capita, yT, and the share of informal economy in total GDP, zT, as follows:

$$yT = y + (z / 100) * y$$

and respectively

$$zT = z * y / yT$$

In this case, the corresponding correlation between the total GDP per capita and the size of informal economy, as share in total GDP, for the selected European countries in the period 2003-2012 was again strongly negative (the estimated value of the correlation coefficient was -0.710). This time, for the considered period, the correlation coefficient (between yT and zT) was lower than -0.9 for all countries, excepting Greece (-0.426), Luxemburg (-0.720), Ireland (-0.813), Cyprus (-0.841), Malta (-0.842), Hungary (-0.887), Croatia (-0.896), Estonia (-0.896), and Latvia (-0.897).

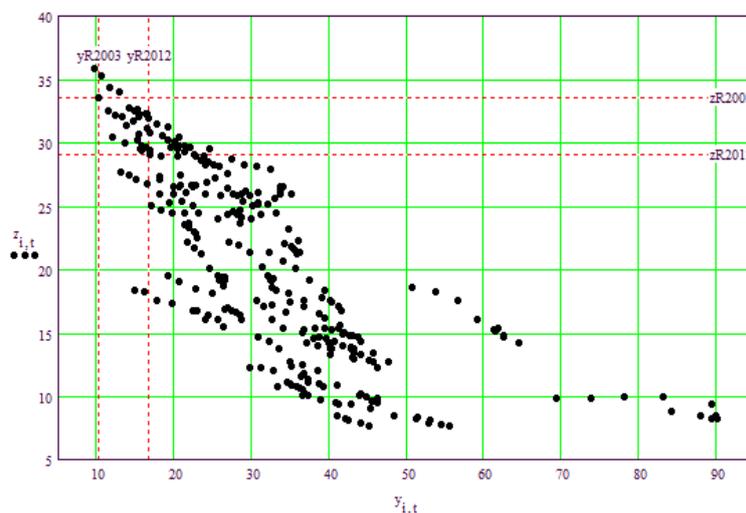


Figure 3

3. Dynamics of informal economy in EU

Referring to the European Union (28 countries), the estimated average size of informal economy decreased from 20.0% of official GDP (expressed in PPP) in 2003 to 17.0% in 2012, as it is shown in Figure 4 (where z_M is the EU average level, and z_{23} is Romania; t being time, from 1 to 10, corresponding to years of the period 2003-2012).

Higher values in 2003 and in 2012 registered Bulgaria (35.9% and 31.9%), Romania (33.6% and 29.1%), Croatia (32.3% and 29.0%), Lithuania (32.0% and 28.5%), Estonia (30.7% and 28.2%), Latvia (30.4% and 26.1%), Cyprus (28.7% and 25.6%), Greece (28.2% and 24.0%), Poland (27.7% and 24.4%), Malta (26.7% and 25.3%), Slovenia (26.7% and 23.6%), Italy (26.1% and 21.6%), Hungary (25.0% and 22.5%), Portugal (22.2% and 19.4%), Spain (22.2% and 19.2%), and Belgium (21.4% in 2003).

Lower values in the same years registered Luxemburg (9.8% and 8.2%), Austria (10.8% and 7.6%), UK (12.2% and 10.1%), Netherlands (12.7% and 9.5%), France (14.7% and 10.8%), Ireland (15.4% and 12.7%), Germany (17.1% and 13.3%), Denmark (17.4% and 13.4%), Finland (17.6% and 13.3%), Slovakia (18.4 and 15.5%),

and Sweden (18.6% and 14.3%), Czech Rep. (19.5% and 16.0%) and Belgium (16.8% in 2012).

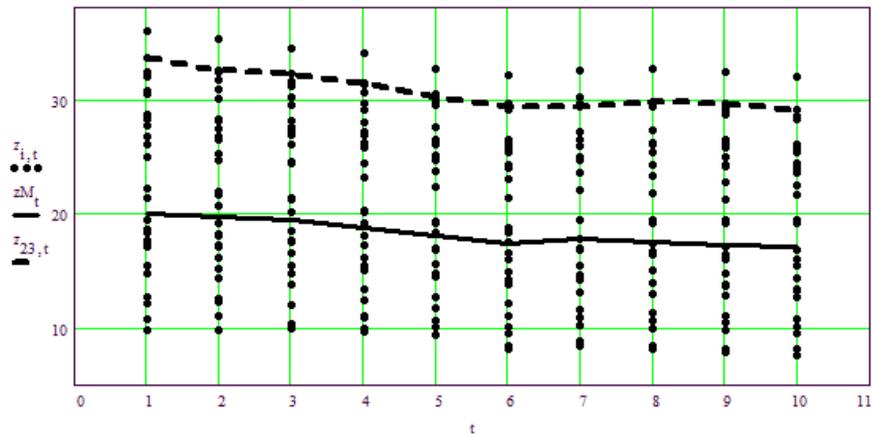


Figure 4

In order to estimate a model to describe the dynamics of the informal economy (this time denoted as y) as a function of income per capita (denoted as x) we selected the following simple hyperbolic function:

$$y(x) = a + b/x + u$$

where y is the share of informal economy, x is the income per capita, and u is residuum.

Applying this model on the data in case of EU28 for the period 2003-2012, the estimation results are presented graphically in Figures 5-7. Moreover, other estimation outputs are as follows:

| Variable | Value | Standard Error | t-ratio | Prob(t) |
|----------|-------------|----------------|-------------|---------|
| a | 5.477509046 | 1.310129905 | 4.180890023 | 0.00004 |
| b | 453.6922814 | 21.41594412 | 21.18479012 | 0.0 |

Coefficient of Multiple Determination (R^2) = 0.6174989195
 Proportion of Variance Explained = 61.74989195%
 Adjusted coefficient of multiple determination (Ra^2) = 0.6161230163
 Durbin-Watson statistic = 1.7575193170675

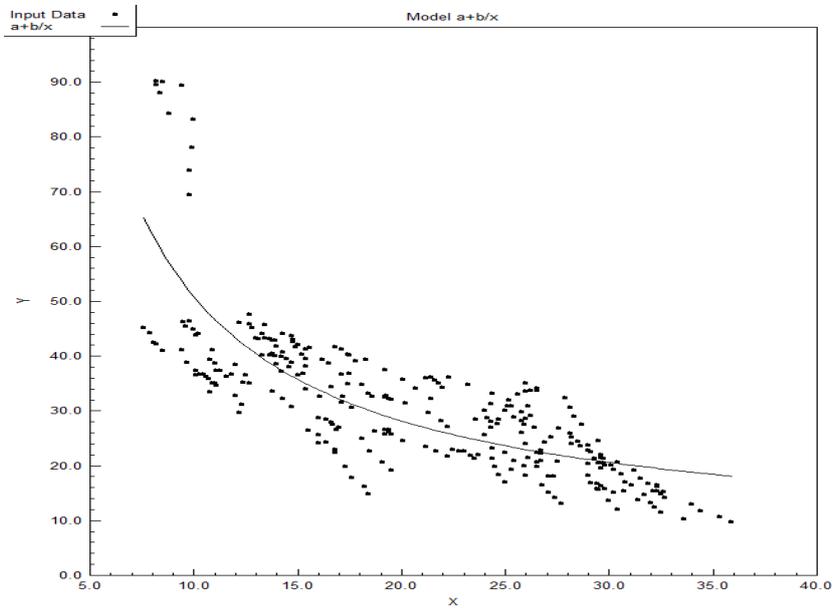


Figure 5

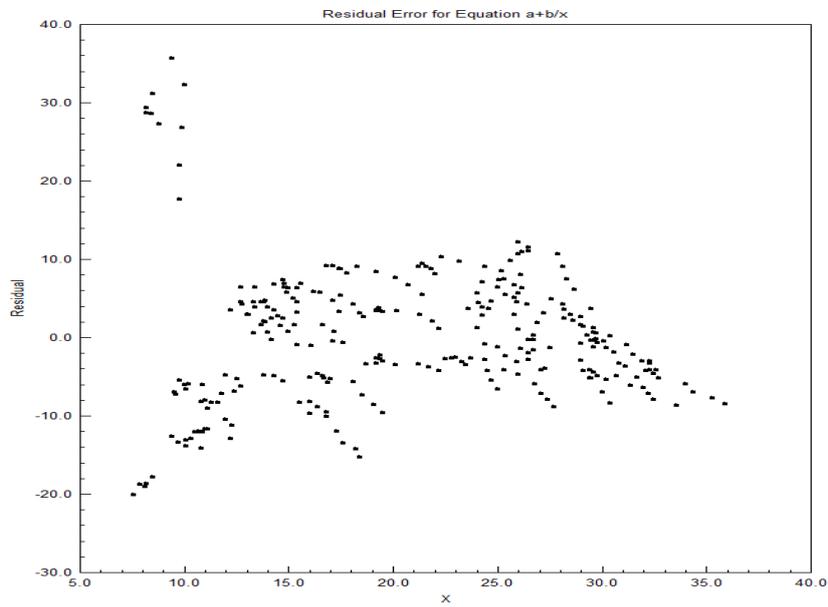


Figure 6

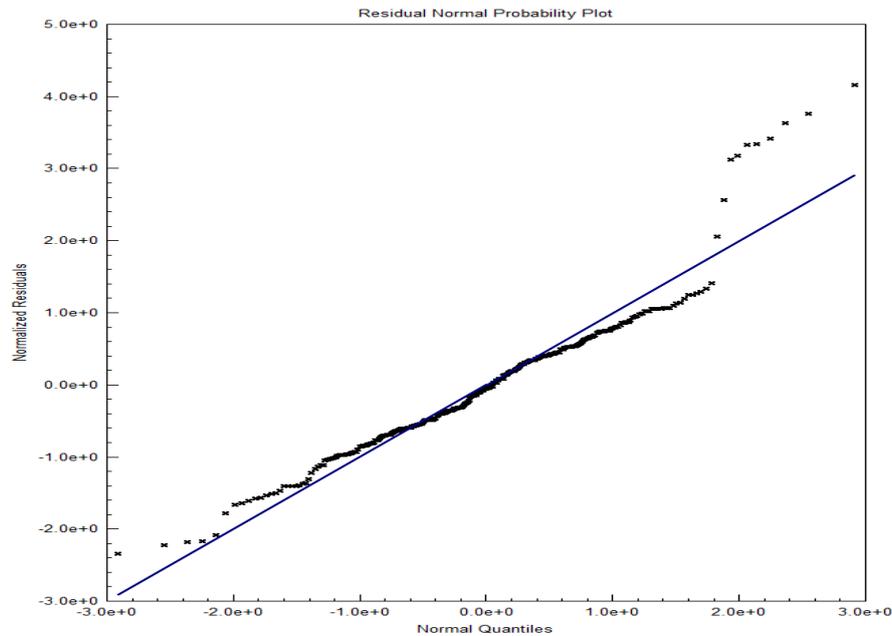


Figure 7

4. Conclusions

The focus of this paper was to formulate a characterization of the informal economy in Europe. For this purpose, the first part of the analysis presents a series of stylized maps of Europe that document on the correlation between the size of informal economy and growth offering a spatial distribution. This approach proves the general idea of a negative correlation between economic development and the size of informal economy. From this point it is possible to estimate the share of informal economy in the total GDP per capita (official GDP plus informal economy). Again the results point to a strongly negative correlation which was lower than 0.9 for the majority of countries excepting: Greece, Luxemburg, Ireland, Cyprus, Malta, Hungary, Croatia, Estonia and Latvia. When discussing the average size of informal economy in the 2003 – 2012 interval we notice a 3% percent drop from 20% to 17%. Building on these results, the last phase of the analysis is centred on a model that fits the above mentioned

dynamics and renders a graphical output of the informal economy trends.

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