

SHADOW ECONOMY AND FOREIGN DIRECT INVESTMENTS: AN EMPIRICAL ANALYSIS FOR THE CASE OF ROMANIA

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Abstract

Shadow economy (SE) represents a controversial phenomenon, present more or less in all economies, whose empirical estimates should be regarded with due reserve.

The main goal of this paper is to analyze the nature of the relationship between Romanian shadow economy, expressed as % of the official GDP and the foreign direct investments (FDI) using two causality analysis methods, namely the Granger causality analysis method and the Toda-Yamamoto procedure, based on quarterly data, over the period 2000-2010. The paper will also try to particularize the implications of this relationship on the sustainable development of the Romanian economy.

For that purpose we will use the shadow economy series estimated in a previous article using one of the monetary approaches, the currency demand approach, based on econometrical methodology of error correction models and co-integration. The quantitative demarche of shadow economy estimation is detailed in author (2013).

The empirical results highlight a unidirectional short-run causality that runs only from foreign direct investments to the shadow economy. The impulse responses function indicates a short-run negative relationship between FDI and SE.

Key words: Granger causality; Toda-Yamamoto approach; shadow economy; foreign direct investments

JEL Classification: E26, F21, P33, C22, C87, C52.

I. INTRODUCTION

The shadow economy (SE) and the foreign direct investments (FDI) are two of the hottest topics in the nowadays reality, across the world. They are raising complex debates, both in the academic environment and also among businessmen and government representatives. Moreover, in the nowadays society, when sustainability is becoming a more and more important topic, scholars consider both phenomena as having a direct impact on the sustainable development of an economy.

Both topics are of a major importance for the Romanian economy today, when the shadow economy is regarded as one of the major threats by the Romanian authorities and when the foreign direct investments are considered one of the most important tools which can fuel the economic growth.

As it is reported in several scientific research papers and in other analyses, the shadow economy is one of the greatest problems which affect the Romanian economical environment. As the literature states, the causes of this phenomenon are multiple and they should be sought among the taxation level, corruption and sometimes inappropriate legislative approach. According to some researchers, the shadow economy is considered to be a barrier for sustainable development, because it causes inefficiency in the functioning of both, the labor market and the market of goods and services and it introduces unfair competition among companies and countries.

The foreign direct investments were regarded by the ex-communist countries, located in the Eastern part of Europe, as one of the most important engines which could accelerate the transition from centralized systems (specific to communist countries) to functional market systems. Therefore, the governments of these states developed different strategies in order to attract as many foreign direct investments as possible. These foreign investments were regarded as an important source for new and superior management skills, new and better paid jobs, technological expertise and new highly competitive products and services. Even though there are some suggesting that companies invest abroad, in developing countries, in order to avoid some legislation regarding environmental issues in their home countries, the great majority agrees that MNCs are bringing into the new host countries higher standards regarding legislation compliance (and also due to the fact that they have a reputation to defend) contributing in this way to the sustainable development of the host economy.

Knowing the importance of these two phenomena it is obvious that obtaining a better understanding of them through scientific research will lead to better economical policies which might drive the entire Romanian

society forward and ensure a sustainable development. Thus, of crucial importance in this regard, would be obtaining a better understanding of the interdependencies created between these two phenomena at the level of the national economy.

To that end in the present paper we will use two main econometric techniques: the Granger causality analysis and the Toda-Yamamoto procedure for the quantification and analysis of the relationship between the Romanian shadow economy and the foreign direct investments.

II. LITERATURE REVIEW AND GENERAL FRAMEWORK

We begin this section of the paper by clearly stating the fact that we are aware that there is a significant amount of literature dealing with different aspects related to the shadow economy and also another important (very large) number of studies concerned with the topic of foreign direct investment. However, it is essential to mention the fact that the amount of literature linking the two phenomena is significantly lower and, moreover, it does not provide a clear conclusion of the existing causal relationship. Even though there are a few published research papers which study the interdependencies between the two phenomena using cross-national data, the authors of this paper are not aware of the existence of such a study at the level of the national literature (for the case of Romania).

It is obvious that the linkages between the two studied phenomena can be both unidirectional and bidirectional. However there are no satisfactory evidences brought by the literature that can clearly prove if the relationship between the two is positive or negative.

Consequently we will structure this section on to main hypothesis:

Hypothesis 1: The shadow economy influences the foreign direct investments received by a country.

Hypothesis 2: The foreign direct investments received by a country impacts the shadow economy.

The shadow economy is a phenomenon which is a reality in all economies around the world nowadays. The magnitude of the phenomenon varies heavily from values around 10 % reaching percentages over 40% of the total value of an economy. The magnitude of the shadow economy in a country depends significantly on political aspects, on corruption related aspects but mostly on the aspects related with the taxation level and taxation policies. Also noteworthy is the fact that the shadow economy is significantly larger (as percentage from the total economy) in developing countries compared to the more developed countries.

According to some researchers, the shadow economy is considered to be a barrier blocking the sustainable development, because it causes inefficiency in the functioning of both, the labor market and the market of goods and services and it introduces unfair competition among companies and countries. More over it is clear that the main principles of the sustainable development are in total contradiction with those guiding the shadow economy and therefore these two phenomena should be considered mutual exclusive. The shadow economy attracts workers from the official economy, harming them by depriving them of their rights and guarantees, and produces a vicious circle, since their exodus from the formal economy reduces tax revenues and consequently the state's ability to conduct public expenditure. Furthermore, it favors corruption and the lack of confidence in institutions, it feeds resentment among citizens and it obstructs the authorities from implementing policies that can support the sustainable development.

Due to the fact that the shadow economy represents an important part in any economy there is an impressive amount of literature which deals with different measurement methods of this phenomenon. Because of the main characteristic of this phenomenon (it represents illegal activities), the methods utilized in the field try to estimate its magnitude based on indirect approaches. Lacko, in a paper published in 1999 and Schneider in a study published in 2005 provide a description (regarding their strengths and weakness) of these methods. The researchers summarize the employed methods in three major clusters: a) Direct methods based on microeconomic theories; b) Indirect methods based on macroeconomic theories; c) MIMIC method;

There are a large number of studies in the literature stating that the main causes of the shadow economy are the taxation level and level of the social contributions [37], [22], [29-36], [24], [19], [12].

Consequently, of great importance for our subject is the development of the tax avoidance industry which has increased significantly the capacity of the capital to cross borders and to avoid in this way the national taxation systems. In the same time governments started to fight each other's (governments of different states which are future potential locations of foreign direct investments) through taxation policies (different advantages and incentives) created in order to create advantages over the competition when trying to attract foreign direct investments [11]. Thus, it became obvious that the decision of most governments to reduce the taxation level (for non-residents mainly) in order to attract foreign direct investments would imply consequences.

In the same time, in order to balance their revenues, governments decided to increase the taxation level for residents (mostly taxes related to labor and consumption), driving some of these economical activities towards the shadow economy.

In this context an important milestone concerning this aspect was marked by the middle of the '80 when the governments and the multinational companies moved their relation towards cooperation, with mutual advantages. As Murtha and Lenway argued in a study from 1994, governments decided to encourage inward flows of foreign direct investments through new taxation policies (lower taxation levels). However, in the recent years, there are experts who support the idea that governments are starting to react against globalization and, therefore, against foreign direct investments.

While some approach the linkage between the foreign direct investments and the shadow economy in the fashion described above, others argue that the foreign direct investments (depending on the type) support the economic growth, increasing therefore the revenues of the governments and impacting negatively the shadow economy.

Another direction pursued in the literature is the one linking the corruption level of a country with the concept of shadow economy. Also, there is a vast literature identifying the corruption as an important determinant of the foreign direct investments attracted by a country [40], [9], [2], [8], [23].

Torgler and Schneider find, in a study conducted in 2007, strong evidence supporting that if the governance and institutional quality are improving, the magnitude of the shadow economy will decrease. The same results are obtained by Friedman [18] when he argues that higher levels of corruption are common in countries with a higher share of shadow economy. Going further, Dreher and Schneider show, in a study published in 2006, that corruption level increases the level of the shadow economy for low-income countries and not for high income countries. In a study conducted on cross-sectional data for 24 transition countries, Abed and Davoodi [1] obtain evidence supporting the idea that corruption has a negative impact on the foreign direct investments. The same results are obtained by Habib and Zurawicki in a study conducted in 2002.

In the same time there are others who suggest that the corruption might play a positive role in attracting foreign direct investment. They suggest that foreign companies interested in investing in a foreign country might offer bribes to corrupt politicians in order to receive special conditions (lower taxation levels and other incentives). Evidences supporting this theory were obtained by Egger and Winner in a study published in 2005, where they have analyzed data for a sample of 73 countries.

The opinions regarding the interdependencies between foreign direct investments and the concept of sustainable development are suggesting two divergent directions. Some researchers claim that companies tend to invest abroad in developing countries with more ambiguous legislations, regarding environmental issues, and with higher corruption levels in order to avoid these aspects regarding sustainability. Therefore, it is obvious that these opinions suggest that foreign direct investment have a negative impact on the sustainable development. Also important, as far as the present research is concerned, is the fact that this behavior is less likely to be characteristic for companies which invest abroad, in a country which is member of the European Union. On the other hand, there are specialists, who state that foreign companies that invest in a country bring with them higher standards regarding regulation compliance. Moreover, it is also easier to grasp the fact that multinational companies tend to follow regulations more strictly due to the fact that they have an important reputation to defend. Another important aspect, regarding the impact of FDI on the sustainable development of an economy is the fact that foreign investors rely on newer technologies which are in most cases more eco friendly and more dedicated to the concept of sustainable development. Therefore, we incline to believe that the inflows of foreign direct investments have a positive impact on the sustainable development, for the case of Romania.

Summarizing, we can assert that the interdependencies between the foreign direct investments and the shadow economy are very complex and they have not been fully clarified and also, their impact on the sustainable development is still under debate. Moreover, these interdependencies can vary significantly from country to country and, also, between different time periods. Therefore, starting from all these theories and assumptions we will try to shed some light over this phenomenon for the case of Romania for the period starting with the year 2000.

III. DATA AND METHODOLOGY

The data used in the research covers the period 2000:Q1- 2010Q2. The variables used are as follows: the estimates of the Romanian shadow economy expressed as % of official GDP, obtained by currency demand approach having as main source the article author(2013); FDI expressed as direct investment flows, expressed as percentage of GDP. The data does not present seasonality. The main data sources used are quarterly databases of Eurostat and Internal Financial Statistics of International Monetary Fund.

The estimations of the size of the shadow economy revealed a decreasing trend over the analyzed period and this trend was confirmed by the studies of Schneider [35] and Albu [3-5].

According to the FDI 2012 statistical survey methodology based on the IMF Balance of Payments Manual, 5th edition (BPM5), foreign direct investment is defined as long-term investment relationship between a resident and a nonresident entity; it usually involves a significant degree of influence exerted by the investor on the management of the enterprise in which he has invested.

The concept of foreign investment used in the IMF Balance of Payments, 5th edition, represents the base for the adopted definition of OCDE in the Manual Detailed Benchmark Definition of Foreign Direct Investment.

In the Balance of Payments Manual-Financial Account, direct investment in reporting economy is direct investment abroad formed by equity capital, reinvested earnings and other capital.

In order to identify the direction of causality between the two (analyzed phenomena) variables, we will briefly list further the econometrical techniques used as parts of the methodological approach proposed in the present paper. Therefore, the list of the econometrical methods and techniques used in this paper contains: non-stationarity tests (ADF and PP tests), Johansen co integration test, estimation of VAR or VECM models, Granger causality method, Toda-Yamamoto approach, together with two short-run analyses impulse response function and variance decomposition.

If the Granger causality analysis requires that the lagged coefficients of the independent variable in each equation are jointly statistically significant, using Wald statistics, Toda-Yamamoto has the advantage of no pre-testing the integration order of variables and also of the co integration rank in the VAR system. Still, we have to mention the main disadvantage of the Toda-Yamamoto procedure, which is represented by the fact that only the short-run causality relationship can be investigated.

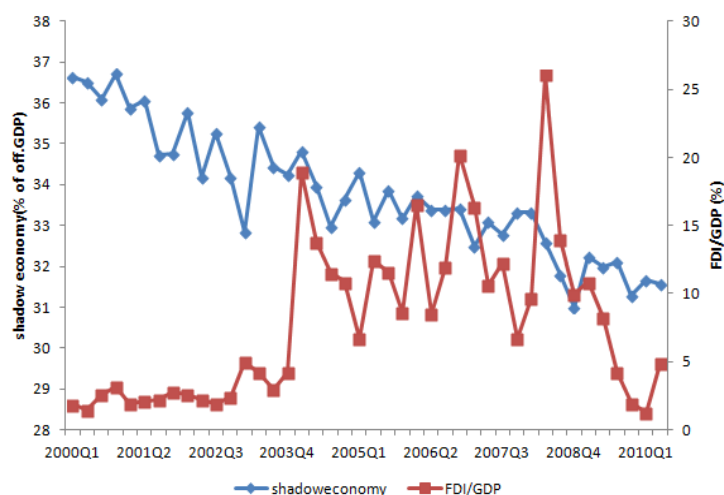
A noteworthy aspect is the fact that the Toda-Yamamoto procedure involves estimating the augmented VAR [dmax + k] model using the Seemingly Unrelated Regression technique [28].

We will not go further with describing the theoretical aspects of the econometrical approach in this paper, due to the fact that the main focus of the study is on the conducted empirical analysis but we suggest that those interested in a detailed presentation of the Granger causality analysis method and of the Toda-Yamamoto causality analysis procedure should study the articles Davidescu (2014), Davidescu and Dobre (2012) and Davidescu and Dobre(2013).

IV. RESULTS AND DISCUSSION

Analyzing the direction and the intensity of the correlation between the shadow economy and the foreign direct investment, we obtain a negative low intensity relationship, quantified by a value of about -0.40 of the correlation coefficient.

Figure 1. Shadow economy vs. foreign direct investment in Romania



Source: Size of the shadow economy (% of official GDP); Internal Financial Statistics (IFS) Database of International Monetary Fund.

As we have stated earlier, the central goal of the present research paper is to shed some light on the interdependencies created between the two analyzed phenomena. Being more specific, we state clearly that further, in this article, the nature of the relationship between the two variables will be investigated and any possible causality relations will be identified. Moreover, the study will also identify the directions of causality.

The analysis of non-stationarity, carried out using the ADF and the PP tests, reveals that the variables are non-stationary at their levels, being integrated of order one, I(1).

4.1. The relationship between FDI and the shadow economy, a Granger causality analysis

In order to investigate if we have a long run relationship between variables, we use the Johansen co integration test. Prior to performing the co-integration tests, we need to determine the optimal lag length estimating a VAR model using un-differenced data (variables in levels) and choosing the lag for which the residuals pass the diagnostic tests of non-autocorrelation, homoscedasticity and normality of the residuals and, additionally, the model fulfills the stability condition. The optimal lag selected according to LR, FPE, AIC and HQ criteria was 3.

The results of the co-integration test suggest the absence of a long-run equilibrium relationship between the two variables, and, therefore, there cannot be a long-run causality between the foreign direct investments and the shadow economy.

If the variables are non-stationary (integrated of order one, I(1)), but collectively not co integrated, the VAR model in first difference can be employed (we will have only short-run results) and, in order to analyze the significance of the obtained results, the F-test should be statistically significant. This is due to the fact that the VAR model in differences contains only information on short-run relationships between variables. The coefficients of the VAR model are statistically significant and the model is valid as shown by the F-test. Noteworthy are also the following aspects regarding the residuals: they are homoskedastic (prob.>0.05) not auto-correlated, but not normally distributed.

In order to verify the short run Granger causality under VAR model, we need to jointly test if in the equation of shadow economy (dependent variable), the estimated lagged coefficients of FDI are different from zero with the help of the F-statistic or the Wald test. When the jointly test rejects the two null hypotheses both these coefficients are not different from zero, causal relationships between shadow economy and foreign direct investments are confirmed. The same analysis needs to be performed for the case of the FDI model (where the foreign direct investment represents the dependent variable).

Table 1. The results of the Granger causality analysis.

Null hypothesis	Wald statistics (Chi-square test)	p-values	Decision ^a
H_0 : FDI does not Granger cause SE	9.444	0.0239**	Reject H_0
H_0 : SE does not Granger cause FDI	4.397	0.2216	Accept H_0

* 1% level, respectively ** 5% level.

Source: Authors' work using E-views software

The empirical results presented in table 1 pointed out that we have a unidirectional short run causality that runs from foreign direct investments to the shadow economy because we have a very low probability, which allows us to reject the null hypothesis of Granger non-causality. For the second model, we can accept the null hypothesis of non-causality, meaning that SE does not Granger cause FDI.

In order to quantify the effects of a shock in the foreign direct investment on the size of the Romanian shadow economy, we will apply the generalized impulse response functions (GIRFs) proposed by Pesaran and Shin[27], who unlike the Colesky decomposition, is not sensitive to the ordering of the variables.

The graphic presents the responses of the shadow economy to shocks registered in the foreign direct investments. The results presented in figure 2 suggest that the shadow economy declines during the first two quarters following the initial shock, by about 0.15% at the end of the third quarter, due to a positive shock in foreign direct investment. The response of the shadow economy to a positive shock in FDI reveals an oscillating evolution. In the fourth quarter, following the initial shock, we observed an increase in the size of the shadow economy by about 0.20%.

Summarizing, it is important to point out an oscillate evolution, declining growth type, that will decrease gradually in intensity until the end of the eight quarter.

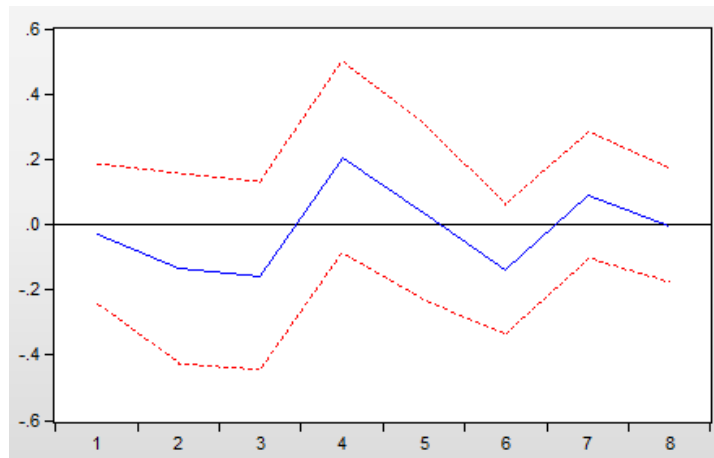
In conclusion, we can assert that there is a unidirectional negative short run causality relation that runs from FDI to SE, meaning that the response of the shadow economy will be negative to a positive shock in FDI (the size of the shadow economy decreases when the inflow of foreign direct investments presents an increasing trend).

One possible explanation can reside in the fact that FDI affects government tax revenues positively, meaning that higher levels of investment are expected to increase production, thus directly increase the domestic taxes on income and on goods and services if the production is sold in the country and, indirectly, through an increased quantity of the domestic income that brings higher levels of income taxes if it is sold abroad.

Nikopour et al [26] state that FDI will induce a greater participation of domestic firms in the activities of the production chain and thus, the expected higher productivity of these firms will provide an additional channel

through which tax revenues are expected to increase. Therefore, FDI are expected to stimulate the tax system reform, leading to tax evasion decrease and, by consequence, to a decrease in the size of the shadow economy.

Figure 2. Response of the Shadow Economy to a shock in Foreign Direct Investment



The variance decomposition analysis will enable us to determine the proportion of shadow economy accounted for, by its own shocks and by the shocks registered by the other variables. The reported figures (table 2) indicate the percentage of variation in each variable that can be attributed to its own shock and to the shocks suffered by the other variables in the system.

A substantial portion of the variance of the shadow economy (C) (93.76%) is explained by its own innovations (or shocks) in the short-run (at 3-quarters horizon) and only a small portion (6.23%) by the shocks in FDI. However, in the long run (8 quarters horizon), the shocks registered in the foreign direct investment explain about 13.3%, of the shocks in the shadow economy.

Table 2. Variance Decomposition of shadow economy

Period	S.E.	D(SE)	D(FDI)
1	0.663066	100.0000	0.000000
2	0.870991	96.58329	3.416707
3	0.890021	93.76325	6.236746
4	0.915747	88.94550	11.05450
5	0.925441	89.06280	10.93720
6	0.941490	87.41949	12.58051
7	0.946075	86.59501	13.40499
8	0.949175	86.67549	13.32451

Cholesky Ordering: D(SE) D(FDI)

Source: Authors' work using E-views software

4.2. The relationship between FDI and shadow economy using Toda Yamamoto

The Toda-Yamamoto procedure involves a three step methodology as follows:

- a) Step 1: a test for the order of integration,
- b) Step 2: the identification of the optimal lag based on information criteria
- c) Step 3: the usage of the Wald test in order to analyze the non-causality relation between shadow economy (SE) and foreign direct investment (FDI).

Due to the fact that previously, both variables were identified to be I(1), we select the maximum order of integration in the VAR system as being 1 ($d_{max} = 1$). Going further, due to the fact that the optimal lag was chosen to be p=3, we will further estimate an augmented VAR (4) model in order to investigate the relationship

between shadow economy and foreign direct investment. Important to mention at this point is the fact that the residuals of the VAR model pass the serial correlation and heteroscedasticity tests.

Table 3. The Toda-Yamamoto causality results

	Null hypothesis	p	MWald statistics	p-values	Decision
$k = 3$					
	H_0 : FDI does not Granger cause SE	4	8.397	0.0385**	Reject H_0
	H_0 : SE does not Granger cause FDI	4	4.251	0.235	Do not reject H_0

* 1% level, respectively ** 5% level.

Source: Authors' work using E-views software

The empirical results (presented synthetically in Table 3) revealed only the existence of the causality running from the foreign direct investment to the shadow economy at the 5% level of significance. It is also obvious that the hypothesis of a bidirectional causal relationship between the two variables is not confirmed.

Summarizing this section of the paper, we state again that both procedures which were used suggest the existence of a unidirectional causality relation that runs from foreign direct investments to shadow economy.

Therefore, it is reasonable to assume that foreign direct investments attracted by Romania help diminishing the shadow economy and also support the sustainable development. Thus, it is possible to state that foreign companies which invest in Romania are more inclined to comply with the regulations and to support in this way the development of the Romanian economy on the basis of the principles of sustainability. Such a statement can also be supported by the fact that the majority of the foreign investments received by Romania come from countries of the European Union or from the United States of America (countries which are more and more preoccupied by the subject of sustainable development).

V. CONCLUSIONS

The paper investigates the nature of the relationship between the Romanian shadow economy (SE) expressed as % of official GDP and the foreign direct investment using a complex econometrical approach based on Granger causality analysis and on the Toda-Yamamoto procedure. Of significant importance for the implications of the findings of this study is the fact that the set of data which was used represents quarterly data covering the period 2000-2010.

The data set of the shadow economy which was used represents the time series estimated in a previous article, using one of the monetary approaches, namely the currency demand approach based on econometrical methodology of error correction models and co integration. The full quantitative estimation procedure of the shadow economy is detailed in author [6].

The empirical results obtained in this research paper highlight a unidirectional short-run causality relation that runs only from foreign direct investments to the shadow economy. Moreover, another important finding is represented by the fact that the impulse responses function reveals clearly a short-run negative relationship between FDI and SE.

One possible macro economical explanation of these findings might be the fact that FDI stimulates the economical activity and generates a reform in the tax system. This potential reform impacts the propensity of the economical agents to comply with the fiscal regulations and therefore leads to a tax evasion decrease. Following the same logic, we assume that decreasing tax evasion leads to a decrease in the size of the shadow economy.

Therefore, by having a direct negative impact on the size of the shadow economy, it would not be hast to suggest that the foreign direct investments attracted by Romania have a positive impact on the sustainable development of the entire economy. Moreover, due to the fact that the Romanian authorities generally identify the shadow economy as being one of the main problems of the Romanian economy, and the sustainable development as one of the most important goals, in the nowadays reality, these results should be regarded with an increased attention.

Concluding, we believe that the findings of his study should be analyzed carefully by the Romanian policymakers because they reveal an important macroeconomic mechanism of the Romanian economy. Therefore, by correctly using the interdependencies revealed by the present study, we believe that the authorities can develop effective instruments which can impact significantly the shadow economy. Thus, by designing policies which focus mainly on attracting foreign investors, the policymakers have the possibility to indirectly solve the main problem of the Romanian economy, by diminishing the size of the shadow economy. Also of significant importance, regarding these aspects is the typology of the attracted foreign direct investments, due to the fact that the amount of benefits brought to a host country differs heavily. The policy makers should

concentrate their attention on designing policies for attracting those foreign investments (mostly horizontal foreign direct investment) which can bring greater benefits to the national economy and in this way they can support in a significant manner its sustainable development.

For further research we suggest to implement the approach at sector level and, by doing so, to identify the domains in which the attracted foreign direct investments have the greatest impact on the shadow economy. Also, for further research, we believe it would be appropriate to try a quantitative assessment of the linkages registered among the shadow economy, the inflow of foreign direct investments and the sustainable development (the indicators proposed by Eurostat).

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Author Contributions

The authors of this paper are not aware of any other research where the shadow economy is linked to the foreign direct investments for the case of Romania. Therefore we can state that analyzing the relationship between the shadow economy and the foreign direct investments with the Granger Causality method and with the Toda-Yamamoto procedure, for the case of Romania represents the authors’ contribution. Also noteworthy to mention is the fact that the methodological aspects described in this paper are also presented in papers such as author (2014), author (2012) and author (2013), therefore not being original contribution of the authors of this paper.

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