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Fiscal Transparency, Measurement and Determinants: Evidence from 27 Developing Countries

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Abstract

Fiscal transparency has been consistently identified as a key feature of efficient fiscal policy and a prerequisite for good public governance. However, measuring fiscal transparency remains an empirical challenge, and extant literature on developing countries is still sparse. To that end, this paper examines the determinants of fiscal transparency in developing countries. We add to the existing literature by proposing a new replicable index of fiscal transparency that is consistent with the definition provided by the International Monetary Fund and the World Bank. Additional determinants of fiscal transparency, which are exclusively relevant in the study of developing countries, are also examined. In particular, we introduce such factors as natural resources, the openness of the economy, the literacy rate of the population, and the quality of institutions. Because of possible endogeneity arising from interdependence among some variables, two-stage least squares (2SLS) is used to ensure that the estimators are consistent. As a robustness check, the same estimation procedure was replicated by replacing our index of fiscal transparency with respectively the index of Andreula et al. (2009) and the Open Budget Index, both of which use a significant similar number of developing countries of our selected sample. The paper found that the level of natural resources and the openness of the capital account negatively affect fiscal transparency. However, the quality of institutions and literacy were found to positively affect fiscal transparency. These results were robust to the measure of fiscal transparency. The findings of this paper provide an explanation of why, after a decade of fiscal transparency programs, many developing countries are still lagging behind, thereby losing the potential benefits mentioned in the literature. These findings could help guide policies directed at improving the level of fiscal transparency in developing countries.

Keywords: Fiscal Transparency, Development, Natural Resources, Institutions Quality, Literacy, and Economic Openness.

JEL Codes: K4, 057, H5, D73

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1. Introduction

The relevance of fiscal transparency as a feature of efficient fiscal policy is central to the current debate about improving public governance and its consequences. Most of the arguments center on the possible advantages of fiscal transparency in terms of fiscal discipline, reduction of deficits and management of public debt, or budgetary credibility. With the support of several international organizations, a growing body of literature has emerged; much of it being concerned with the measurement and determinants of fiscal transparency.¹

Several definitions have been proposed to explain the concept of fiscal transparency. The most cited definition is that of Kopits and Craig (1998) who consider fiscal transparency as: *“openness toward the public at large about government structure and functions, fiscal policy intentions, public sector accounts, and projections. It involves ready access to reliable, comprehensive, timely, understandable, and internationally comparable information on government activities so that the electorate and financial markets can accurately assess the government’s financial position and the true costs and benefits of government activities, including their present and future economic and social implications.”* In other words, fiscal transparency can be summarized as the systematic and timely release of all relevant fiscal information (Benito and Bastida 2009). The above definition splits the world into two groups of countries: developed countries which have strong enough institutions to achieve high transparency of the budget, on the one hand, and developing countries which still face fiscal opacity, on the other hand. Therefore, an analysis of this issue might require taking into account such differences. Yet, recent analyses have studied heterogeneous samples of countries,

¹Precisely, after the Mexican economic crisis (of 1994/1995) and the Asian financial crises (of 1997), many international organizations such as the World Bank, the IMF, and the OECD identified fiscal transparency as a key aspect of good governance. Accordingly, they initiated several programs including the Code of Good Practices on Fiscal Transparency - Declaration on Principles in 1998 (revised in 2007), followed in 2001 by the OECD *Best Practices for Budget Transparency*, and by the multi-stakeholder *Extractive Industries Transparency Initiative* (EITI), launched in 2002, to address resource revenue transparency issues in resource-rich countries. Furthermore, the IMF and the World Bank have jointly prepared the *“Reports of the Observance of Standards and Codes”* (ROSCs).

taking together developed, emergent and developing countries. This has led to results that are too general to be associated with a specific group, such as developing countries.

This paper then aims at identifying some critical determinants of fiscal transparency typical for developing countries. We want to verify whether some institutional and socio-economical indicators—namely, natural resources wealth, degree of trade openness, low literacy and quality of the institutions—are associated with the level of fiscal transparency in developing countries. The objective of this study is at least twofold. First, to provide an idea of why, after a decade of fiscal transparency programs, many developing countries are still lagging behind, thereby losing the potential benefits mentioned in the literature. Second, to identify and analyse factors, which may enable the improvement of fiscal transparency in the case of developing countries.

The paper is organized as follows: Section two is a short review of relevant literature on the measurement and determinants of fiscal transparency. Section three presents a direct and replicable index measuring fiscal transparency practice, constructed for this analysis. In Section four, that index is used empirically to examine the determinants of fiscal transparency. Section five discusses the results. Section six conducts a robustness check of the results using other indices for fiscal transparency. Section seven summarises the conclusions.

2. Measurement and Determinants of Fiscal Transparency: A Review of the Literature

In general, several variables have been found to determine good public governance. Rose-Ackerman (2005), Lederman et al. (2005), and Damania et al. (2004) have considered economic and political freedom, globalization and level of development, as significant factors of good public governance.

While several researchers, such as Andreula et al. (2009) present fiscal transparency as a prerequisite for good governance, the literature on its determinants is still very limited. Moreover, some institutional and socio-economic variables are

more likely seen as determinants, rather than parameters, of fiscal transparency.

Alt et al. (2006) investigates, conceptually and empirically, the determinants of fiscal transparency based on data from the United States. They explore two broad sets of explanatory factors under which politicians might implement more transparent budgetary procedures: the political setting and the fiscal environment. They found that both political and fiscal outcomes affect the level of transparency; that political competition tends to increase the level of fiscal transparency, and that fiscal imbalance, in the form of higher surpluses or deficits, also contributes to higher transparency. Andreula et al. (2009) extends their analysis to the relation between institutional factors and fiscal transparency. They concluded that higher levels of institutional quality give way to better indicators of fiscal transparency. Ellis and Fender (2006) also find fiscal transparency to be associated, implicitly or explicitly, with the existence of levels of corruption and vice versa.

Ross (2011) studied the correlation between mineral wealth and fiscal transparency, based on a sample of 83 countries. He found that the link between natural wealth and fiscal transparency depends on the existing political system. Among democracies, a country's mineral wealth is not related to the transparency of its government. But among autocracies, greater oil wealth is correlated with less fiscal transparency, while greater non-fuel mineral wealth is paradoxically associated with greater transparency.

In general, according to the broad definition given above, Bernardino and Bastida (2009) noticed that fiscal transparency goes along with two important factors: an effective legislation that scrutinizes budget reports, discusses and influences budget policy; and an effective civil society, represented through the media and nongovernmental organizations, which influences budget policy and hold government accountable. Also, the IMF Code of Good Practices on Fiscal Transparency makes recommendations indicated to achieve a greater level of fiscal transparency. The organizational framework for the Code is based on four general principles that aim to capture the essential elements of fiscal transparency: clarity of roles and responsibilities; public availability of information; openness of the budget preparation, execution and reporting; and independent assurances of Integrity.

The most important challenge of the literature on fiscal transparency remains its measurement. The economic literature on fiscal transparency is of recent origin, but the existing measures are already quite diverse (De Simone, 2009). Most of these measures are constructed using non-numerical reports. For example Hameed (2005), Jarmuzek et al (2006) and Andreula et al. (2009) use the Reports on the Observance of Standards and Codes (ROSCs) which are consistent with IMF and the World Bank definition, such as stated in the Code Of Good Practice of fiscal transparency. They assigned numerical values to the performance of the countries selected according specific aspects of the reports. Following the same definition, Glennerster and Shin (2003) proposed a simpler index. Their index measures the simple adherence to principles of fiscal transparency by using dummy variable to evaluate whether or not a country has published an Article IV report or a ROSC, or whether it has complied with the Special Data Dissemination Standard (SDDS).

Other indices of fiscal transparency proposed in the literature are constructed using different source documents. Gelos and Wei (2005) considered the yearly Global Competitiveness Report for various years produced by the World Economic, while Alt and Lassen (2003), Andersen and Nielsen (2010) used the self-reported OECD's Best Practices for Budget Transparency data. Also the International Budget Partnership (IBP) provides the biannual Open Budget Index (OBI). This uses a survey conducted by intermediate organisations or pressure groups of sample countries which focuses on whether the government provides the public with timely access to comprehensive information contained in eight key budget documents.

In addition to the differences in the definition of fiscal transparency, some indices are limited geographically. Guerrero and Hofbauer (2001) propose an index of budget transparency for five Latin American countries: Argentina, Brazil, Chile, Mexico, and Peru. The index measures the degree of accessibility and utility of information issued by national governments with respect to finances, revenues and expenditures.

The index proposed by Bernardino and Bastida (2009) matches the World Bank Budgeting Database with the "OECD Best Practices for Budget Transparency". Bernoth and Wolff (2008) follow that approach and propose two measures of fiscal

transparency: one is an index of auditing, calculated using the answers collected by an OECD and World Bank survey in 2003; the second index is based on the indicator developed by von Hagen (1992), Hallerberg et al. (2001) and Hallerberg et al. (2005). The latter measures three things: (a) the assessments of transparency carried out by government officials; (b) the degree to which special funds are included in the budget draft; (c) information on whether the budget is a unique document, whether the budget is linked to national accounts, and whether government loans are included.

3. Construction of the Fiscal Transparency Index

This section first introduces four modules which are retained by way of organising information from the ROSC. The definition of the modules matches the codes of the 2001 and 2007 manuals. The modules enable the construction of a fiscal transparency index. This index is then compared with other indices which already exist in the literature.

3.1. The Modules

Following Hameed (2005), Jarmuzek et al. (2006), and Andreula et al. (2009) four modules are considered: (a) “Budget Structure” (BST) evaluates the presentation and structure of the budget; (b) “Budget Objectivity” (BO) captures the realism of the budget’s objectives; (c) “Budget Process” (BP) evaluates the control of the execution of the budget; (d) “Extra Budgetary Activity” (EBA) assesses the weakness of the budget in terms of the government transactions that are not included in the budget documents. These four modules are independently constituted of four or five practices, each of which corresponds to one or two codes in the 2001 IMF Manual of Fiscal transparency. These modules are then updated by matching the selected codes with corresponding codes in the 2007 Manual. This has the following implications.

First, several codes included in the 2001 Manual ended up having more than one correspondent code in the Manual of 2007. The wordings of the codes in the Manual of 2007 are sometimes different from those of the Manual of 2001, due to the

fact that the 2007 Manual is more exhaustive and therefore contains more codes. For example, the practice first named “Projections guided by a Medium-term Economic Framework” corresponds to code 3.1.3 in the 2001 Manual that says: “The annual budget should be prepared and presented within a comprehensive and consistent quantitative macroeconomic framework, and the main assumptions underlying the budget should be provided”. The corresponding code in the 2007 Manual is code 2.1.2. The latter adds a fiscal aspect to the economic framework as follows: “The annual budget should be realistic, and should be prepared and presented within a comprehensive medium-term macroeconomic and fiscal policy framework. Fiscal targets and any fiscal rules should be clearly stated and explained”. In view of this statement, code 4.1.1 of the 2007 Manual becomes a relevant part of the same practice, since it states: “Budget forecasts and updates should reflect recent revenue and expenditure trends, underlying macroeconomic developments, and well-defined policy commitments.” Thus that practice is labelled, “Projections guided by a Medium-Term Economic and Fiscal Framework”.

Second, some codes in the 2001 Manual do not have an exact correspondent in the 2007 manual. This is true in the case of the code 3.1.4 in the 2001 Manual, which states: “New policies being introduced in the annual budget should be clearly described”. No code in the 2007 Manual comes close to the meaning of this statement. Therefore, no practice on these codes was defined in any module.

Third, some codes are quite close in meaning, in moving from the 2001 Manual to the 2007 Manual. This is the case for the practices that correspond to codes 4.2.1 and 3.3.3 of Manual of 2001. For code 4.2.1 the corresponding in Manual 2007 is 4.3.1, which says: “Public finances and policies should be subject to scrutiny by a national audit body or an equivalent organization that is independent of the executive”, and corresponding to code 3.3.3 is code 4.2.5, which states: “Government activities and finances should be internally audited, and audit procedures should be open to review”. Thus, both codes have been merged into a single practice named “National Independent Audit”.

Table 1 presents the final classification. The first column presents the four modules, the second column includes the practices finally retained, the third column gives the codes in the 2001 IMF Manual, while the last column presents the corresponding codes in the 2007 IMF Manual.

Table 1. Fiscal transparency modules

Number	Modules	Practices of fiscal transparency	Code (2001)	Code (2007)
1	Budget Structure	Budget classification Release of data Budget coverage Independent Assessment of Forecast Budget realism	3.2.1 2.2.1, 2.2.2 2.1.1, 3.2.1 4.2.2 4.1.1	3.2.2, 3.2.1 3.3.2, 3.3.1 3.1.1 4.3.3 4.1.1
2	Budget Objectivity	Policy objectives and sustainability Forward Estimates Projections guided by a Medium-term Economic and Fiscal Framework Fiscal/Macro risk	3.1.1 2.1.2 3.1.3 3.1.5	2.1.4, 2.1.2, 3.1.7 3.1.2 2.1.2, 4.1.1 3.1.3
3	Budget Process	Accounting system National independent audit Final account Mid-year reporting	3.3.1 4.2.1; 3.3.3 3.4.2 3.4.1	4.1.2, 2.2.1 4.2.5, 4.3.1, 4.3.2, 4.3.4 2.2.4 2.2.2
4	Extra-Budgetary Activities	Contingent liabilities Debt Quasi-fiscal activity – Financial Quasi-fiscal activity – NFPE Tax expenditures	2.1.3 2.1.4 2.1.3, 1.1.4 2.1.3, 1.1.4 2.1.3	3.1.3 3.1.5, 3.2.3 3.1.3, 1.1.4 3.1.3, 3.1.6, 1.1.4 3.1.3

In order to derive an index that is more objective than the earlier ones and consistent with the current study, this paper defines three criteria as follows: firstly, every ROSC considered should be that of a developing country²; secondly, every ROSC should have been published in 2004 or after for the reasons previously mentioned. On the basis of these first two criteria, only 27 developing countries' fiscal transparency policies were rated. Thirdly, all ROSCs published between 2004

² According to the International Monetary Fund's World Economic Outlook Report, April 2012.

and 2007 should be examined based on the 2001 Manual (Column 3), while those published after 2007 should be examined based on the 2007 Manual (Column 4).

3.2. Fiscal Transparency Index

For each of the practices contained in Table 1, a value P_j is assigned. P_j assumes the values 0; 0.33; 0.66 or 1, with 0 being assigned when the practice is not observed at all and 1 when it is completely observed (like in Hameed (2005)). 0.33 and 0.66 are respectively the lower and the upper intermediate values. Such a range reduces subjectivity in evaluating the practices, and makes comparison of countries easier. A very short range of numbers like the dummy variables used by Glennerster and Shin (2003) excludes de facto the intermediate stages in the implementation of transparency standards-while the use of a very long range of numbers increases the subjectivity of the index. In fact, the ROSCs are reports written by different IMF officers, on different countries and at different times. Thus, some terms and expressions are likely to have similar meanings. For example, Andreula et al. (2009) used a range of 10 numbers. They assigned different numbers to some practices like “adherence limited”, “Code partly followed” or “Code mostly followed”, which do not seem to be essentially different.

The calculation of the fiscal transparency index follows two steps: the calculation of the modules indices, and the calculation of the comprehensive index. For the calculation of the sub-indices we consider the sample average of the available evaluated practices. In symbols the sample average of the evaluated practices is

$$SI_i = \frac{1}{N_i} \sum_{j=1}^{N_i} P_j \quad i = 1,2,3,4 \quad (1)$$

with $SI = BS, BO, BP, EBA$ —respectively Budget Structure, Budget Objectivity, Budget Process, Extra- Budgetary Activities—corresponds to the modules as defined in Table1, while P_j refers to fiscal transparency practice j . N_i is the number of fiscal transparency practices P_j that are rated in the ROSC of a country corresponding to a specific module I , with $i = 1,2,3$ or 4 corresponding to the four modules defined in

Table 1. For example, $N_i = 4$ means that four practices were rated in module i . This may be less than the maximum number of practices to be rated in that module, due to missing information.

There are at least two advantages of using the simple average in this case. First, it leads to an index that is not affected by the lack of information in the ROSC of countries. One option would be to keep N constant over the countries of the sample. But that option makes sense if the ROSC specifies that missing information is the responsibility of the country. In such cases we assign 0 to the corresponding practice. Otherwise the country's index would be unfairly reduced. Second, it assigns no weight to any particular practice. In other words, all the practices are equally weighted. The reason is that the Manuals do not assign different scores to the Codes, each of them being equally important for the implementation of the fiscal transparency program.

The final index, FT, is the simple average of all the available practices evaluated as in equation 2.

$$FT = \frac{1}{N} \sum_{j=1}^N P_j \quad ; \quad N = \sum_i N_i \quad (2)$$

This index displays continuous variables contained in the interval 0 to 1. For the rest of this paper, FT will refer to this fiscal transparency index. Note that N is the number of practices rated. It is different among some countries of the sample, once again due to missing information.

Table 2 presents the FT and its sub-indices for the group of 27 developing countries and shows wide variations among countries. Kenya, Thailand and Ukraine have the highest level of fiscal transparency, while Jordan, Cameroon and Mozambique are the least transparent countries according to this index.

Table 2. Indices of fiscal transparency

Country	RoscYear	BS	BO	BP	EBA	FT
Kenya	2008	0.66	0.83	0.50	0.80	0.70
Thailand	2009	0.93	0.41	0.58	0.60	0.65
Ukraine	2004	0.86	0.66	0.58	0.46	0.64
Indonesia	2010	0.73	0.58	0.75	0.53	0.64
Moldova	2004	0.83	0.83	0.58	0.33	0.63
Gabon	2006	0.53	0.55	0.58	0.60	0.56
Macedonia	2006	0.73	0.50	0.83	0.13	0.53
Morocco	2005	0.53	0.50	0.75	0.40	0.53
Namibia	2008	0.40	0.83	0.66	0.33	0.53
Bulgaria	2005	0.53	0.58	0.58	0.33	0.50
Guatemala	2006	0.75	0.33	0.50	0.33	0.47
Algeria	2005	0.50	0.50	0.41	0.46	0.47
Timor Leste	2010	0.80	0.25	0.75	0.07	0.46
Barbados	2007	0.53	0.42	0.66	0.26	0.46
Croatia	2004	0.73	0.33	0.66	0.13	0.46
Ghana	2004	0.33	0.83	0.58	0.13	0.45
Costa Rica	2007	0.60	0.42	0.58	0.20	0.44
serbia	2009	0.66	0.66	0.17	0.26	0.44
Lebanon	2005	0.50	0.17	0.58	0.46	0.43
Paraguay	2006	0.60	0.08	0.75	0.20	0.41
Tajikistan	2007	0.40	0.66	0.50	0.13	0.40
Kyrgyz	2008	0.60	0.33	0.41	0.13	0.37
Eq Guinea	2005	0.41	0.42	0.22	0.33	0.35
El Salvador	2011	0.60	0.17	0.50	0.08	0.35
Mozambique	2008	0.53	0.33	0.33	0.07	0.31
Cameroon	2010	0.53	0.25	0.25	0.08	0.29
Jordan	2006	0.33	0.17	0.25	0.26	0.26

3.3. Correlation Among the Indices

This section first presents the correlation among the sub-indices; the objective is to see how they are interrelated. Next, it presents a summary of each sub-index in order to see the most observed fiscal transparency practices in the sample of countries.

Table 3. Correlation among Fiscal Transparency Indices

Indices	FT	BS	BO	BP	EBA
BS	0.5904	1			
BO	0.6327	0.0135	1		
BP	0.5424	0.3381	0.0918	1	
EBA	0.7236	0.2166	0.3811	0.0892	1

FT corresponds to the comprehensive index as presented in the text. BS, BO, BP and EBA are its sub-indices. The correlation is obtained on the indices defined for 27 countries based on their ROCS available on www.imf.org. The values in bold represent the correlation with the Comprehensive index, FT

As depicted in Table 3, each of the sub-indices has a strong positive correlation with the final comprehensive fiscal transparency index (FT). EBA has the strongest correlation with FT. This is possibly because EBA gives less weight to information about government fiscal activity. Also table 3 reveals that the sub-indices are not highly correlated to one another. This means that each subset of practices is actually different from the others. One reason is the improvement in the structure and the presentation of the ROSCs, which occurred since 2004, in response to comments made about earlier ROSCs as reported in Petrie (2003). All this makes the assessment of fiscal transparency practices easier.

Table 4. Summary Statistics of Fiscal Transparency Indices

Module	Obs	Mean	Std. Dev.	Min	Max
BS	27	0.6	0.16	0.33	0.93
BO	27	0.47	0.22	0.08	0.83
BP	27	0.54	0.18	0.17	0.83
EBA	27	0.3	0.19	0.07	0.8
FT	27	0.47	0.21	0.26	0.7

This table presents a descriptive statistics of the indices that we constructed including the maximum and the minimum value, as well as the mean and the standard deviation for all the 27 countries of the sample.

Overall it is clear from Table 4 that, the level of fiscal transparency in this sample does not seem to be as low as described in the literature, even though some countries display very low sub-indices. Indeed, several recent studies found very low levels of fiscal transparency for most of developing countries (Hameed, 2005; Jarmuzek et al., 2006; Benito and Bastida, 2009). However, Table 4 shows that the module of Budget Structure (BS) represents the set of most observed practices of fiscal transparency, while the least implemented practices are regrouped in the module of Extra Budgetary Activities (EBA). This result is intuitive in the sense that it shows that in developing countries, the presentation of fiscal documents is respectful of international standards, while the actual contents of the documents fall short of expectations.

3.4. Comparison with Other Indices

We believe that the constructed Fiscal Transparency Index is more objective, compared to other indices proposed in the literature for the following reasons: First, this paper follows the main principle of fiscal transparency as defined by the IMF, following Hameed (2005) or Jarmuzek et al. (2006). The main framework of fiscal transparency that developing countries follow is the one defined by the IMF and the World Bank, possibly because of their membership or because these institutions are their main funding agencies. Based on that, our approach evaluates the practice of fiscal transparency rather than sole adherence to principles. It uses the ROSCs, which are reports written by independent IMF officers on the level of observance of the IMF recommendations. These ROSCs follow the structure of the IMF Manuals and contain information that varies from one country to another. In contrast, for example, the OECD's Best Practices for Budget Transparency data are self-reported data, where some countries are likely to have rated themselves too highly.

Second, the index FT is very comprehensive. It combines the methodologies used by Hameed (2005), Jarmuzek et al. (2006) and Andrula et al. (2009). In addition to the practices retained by these authors, we added new ones. This is unusual, as the approaches to constructing fiscal transparency indices used by authors in the

literature are often different from each other, leading to very diverse indices.

Third, the present index is constructed using both the 2001 and 2007 IMF Manuals of Fiscal Transparency. Even though the original definition of fiscal transparency provided by Kopits and Craig (1998) continues to form the basis of the 2007 Manual, the order in which the pillars of the codes are presented, the reorganization, and the additional codes introduced improve the clarity and the coherence of the overall Manual.

Fourth, this paper considers only the ROSCs published in 2004 or after. From 2004 on, the IMF officers improved the structure of the ROSCs in the sense that each observation given is associated with its corresponding (code) as stated in the IMF Manual (2001 or 2007).³ This makes the rating of the practices more objective compared to the ratings that were based on the ROSC before 2004. As Petrie (2003 p.6) argued, the ROSCs published before 2004 were written in a very compact way; the comments were provided without any mention of the practices they were referring to. Any evaluation based on that was very subjective, as the information about a practice is not easy to find. Also, the use of new ROSCs has the advantage of giving the information about the current practice of fiscal transparency that is still true. Therefore it reduces the gap that could exist between the information given by the index and the current real level of countries in terms of fiscal transparency.

In addition to the above points, the present study's sample of countries is sufficiently homogeneous in terms of the level of development, since only developing countries are considered. In other studies like Hameed (2005), Alt and Lassen (2006), Andreula et al. (2009), the samples of countries are more heterogeneous, composed of highly developed, emergent, and developing countries. Even though fiscal transparency is about application of common international standards, the present study intuitively believes that compliance with these standards might depend on the level of development of the country.

³ We did not consider ROSCs that were not structured that this way, even though it was published in or after 2004.

Table 5. Spearman rank correlation between our index and other indices

Indices	Hameed (2005) ⁴	OBI*	Andrula et al. (2009)
FT	0.7588 (0.0007)	0.4164 (0.0429)	0.6406 (0.0007)
BS	0.6558 (0.0058)	0.1481 (0.4898)	0.4973 (0.0134)
BO	0.5404 (0.0307)	0.2681 (0.2053)	0.5497 (0.0054)
BP	0.583 (0.0178)	0.4469 (0.0286)	0.5338 (0.0072)
EBA	0.1411 (0.6023)	0.1543 (0.4716)	0.163 (0.4466)

*We consider the average of the existing indices. The upper numbers represent the Spearman's rho (correlation coefficient). It corresponds to a monotonic trend between ranked variables. The values in bracket represent the P-values (Prob > |t|). It indicates the significance of the coefficient. If the P-value is smaller than 10%, 5% or 1%, the correlation (given by the level of the coefficient) is weak, medium or high, respectively. Any P-value greater than 10% indicates that there is a non-significant monotonic correlation present between both variables.

Table 5 proposes a comparison with the indices constructed by Hameed (2005), Andreula et al. (2009) and IBP's Open Budget Index (OBI) only. We could not extend the comparison to other indices, because the number of countries our index has in common with these indices is too small. In order to eliminate the effect of differences in terms of methodologies and ranges of numbers used, we apply the Spearman (1904) rank correlation test, which considers the rankings of the countries rather than the values assigned by each index. Spearman's correlation coefficient is a statistical measure of the strength of a monotonic relationship between paired data.

It appears that there is a strong, positive monotonic correlation between our fiscal transparency index and the indices respectively constructed by Hameed (2005), Andreula et al. (2009) and the IBP (OBI). So our index is consistent with earlier indices constructed in this field⁵.

⁴ Thanks to Farhan Hameed who kindly sent us his data.

⁵ However the correlation with these indices is not perfect, much of the difference is attributable to several improvements that we have introduced in the construction of our index.

4. Empirical Analysis of the Determinants of Fiscal Transparency

The empirical analysis of this paper consists of two steps: first the choice of the potential determinants, and second the specification of a model according to that choice and its estimation.

4.1. Choice of Variables

Following the literature on the issue of public governance, four main aspects of the economy are considered here that potentially affect the level of fiscal transparency of a country: the natural wealth of the country, the quality of the institutions, the literacy level of the population, and the openness to trade and to international capital movements. More discussion on the choice of the variables is given below, as well as the sources and definitions of the data. For each of the selected variable, we consider the average of the values over three years, following most of the authors such as Hameed (2005): the two years before and the year of the publication of the ROSC. The objective is to obtain a “semi-causal” correlation test between each of the selected variables and the fiscal transparency index. The following paragraphs propose the discussion about the choice of the variables. In order to check the potential direction of the correlation between each of these variables and fiscal transparency, we propose graphs, which present monotonic trends between each of the selected variables and fiscal transparency (all ranked) for the 27 selected developing countries.

4.1.1. Natural Wealth and Fiscal Transparency

Carbonnier (2007) shows that natural resources revenues tend to widen the budget deficit, in the sense that they lead governments to commit excessive spending or divert these revenues to their advantage for personal gain or political patronage. Earlier, Lane and Tornell (1996) explained these deficits by the fact that politicians redistribute rents to pressure groups and in proportion to income growth. This often takes place at the highest levels of government, distorting contracts that are signed

with extractive industry companies and the terms of agreement for revenues to be paid (Ross, 2011). It also occurs when royalties and other payments are agreed and disbursed unofficially, leading to deployment into personal accounts rather than the state's treasury.

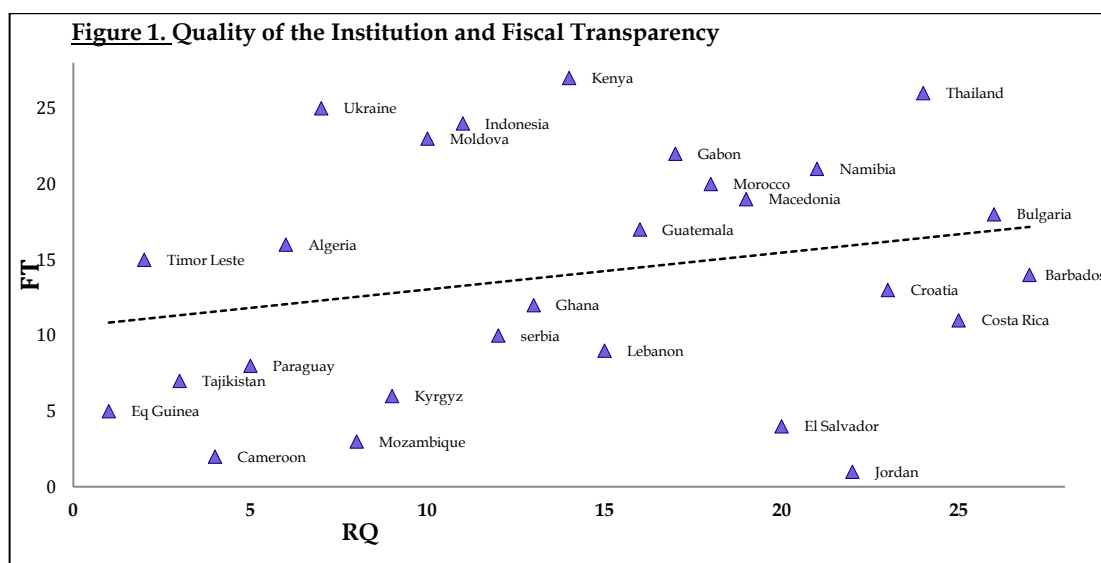
The view in this paper is that, after controlling for some institutional and economic variables, higher levels of natural resources can lead governments to be less transparent, and likely less fiscally disciplined, in developing countries. This can be the result of greater pressure from within the country, but mostly from powerful international companies in the natural resources industry. To capture natural wealth, Total Natural Resources Rents as a share of GDP are used. These are obtained from the World Development Indicators (WDI, 2012). They represent the sum total of oil rents, natural gas rents, coal rents (hard and soft), mineral rents, and forest rents.

4.1.2. Quality of the Institution and Fiscal Transparency

Institutions are the stage where political actors, voters, and markets interact. The insight that institutions matter for government decisions and the outcome of these decisions is of profound importance to good governance, of which FT is a prominent part. Indeed, the first principle of the IMF Code of Good Practices on Fiscal Transparency, issued in 1998, named Clarity of Roles and Responsibilities, requires: “a clear legal and administrative framework for fiscal management”. This implies that fiscal transparency also involves good quality in the institutions. Institutions could affect the behaviour of the political actors, voters and markets, by creating uncertainty about the present and future behaviour of each other. Based on the case of developed countries, Andreula et al. (2009) demonstrated that good quality of institutions has a positive effect on fiscal transparency.

In this paper we take this view that fiscal transparency requires an improvement in the quality of institutions, especially in the case of developing countries. For the data on the quality of the institutions, we use the governance indicators developed by Kaufmann et al. (2003). They combine both large opinion

surveys and measures based on polls of experts to define six indices of governance. Among the six indicators, we consider Regulatory Quality (RQ), which indicates the government's ability to formulate and implement sound policies and regulations. In addition, it has the highest coefficient of correlation with all the other institutional indicators. It is therefore suitable for the present study. The data are drawn from the Worldwide Governance Indicators (WGI, 2011). Figure 1 shows the association between the regulatory indicator and the index of fiscal transparency.



All countries in the sample are ordered in terms of the indicator of regulatory quality and of the fiscal transparency index. Then, all the data were sorted according to the indicator of regulatory quality.

The main observation we can make from Figure 1 is that countries with lower regulatory quality also tend to have lower fiscal transparency. At the low end we have Equatorial Guinea, Cameroon, Tajikistan; Paraguay, whose indicators are all very low. Also, countries with higher index of RQ have relatively higher FT indices. Countries with weaker institutions are also less transparent; thereby confirms the above reasoning.

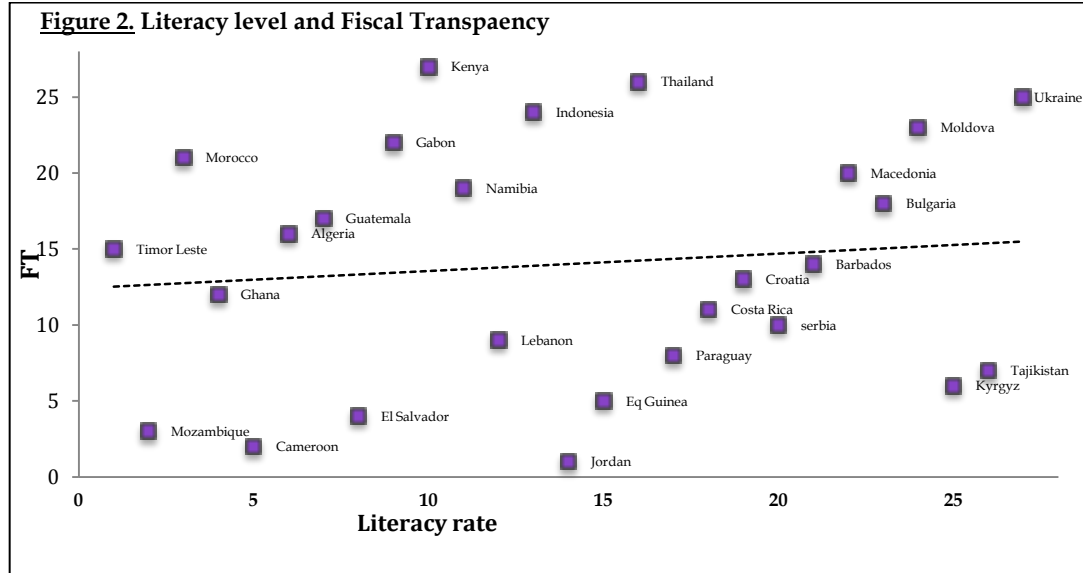
4.1.3. Literacy and Fiscal Transparency

Average literacy rate has been identified as a crucial measure of the value of a regions human capital. Also, several actors and organizations involved in the fight for more budget transparency like the International Budget Partnership (IBP) and The Global Movement for Budget Transparency, Accountability and Participation (BTAP) claim that civil society plays a role in budget transparency by means of pressuring the governments.⁶ Such claims are also strengthened by scientific papers such like Bernardino and Bastida (2009) who conclude that the achievement of a high level of fiscal transparency requires the presence of an effective legislation which scrutinizes budget reports, discusses and influences budget policy; and an effective civil society, as represented by media and nongovernmental organizations, which must influence budget policy and hold government accountable.

Moreover, the view taken here is that the fight of civil society for fiscal transparency is conditional upon the level of literacy of the population. For example, Harvey Graff (1991) finds that a low level of literacy of a population is associated with a level of community engagement and civic participation that is also low. This is because an individual who does not have a sufficient level of education cannot be a full member of society and cannot participate fully in social and political battles. A highly literate population may also have higher understanding of public budgets and strong social mobilization on economic and developmental issues needed to advocate changes in how resources are allocated and used towards the reduction of economic injustice. The level of education of a population is often considered as a control variable in the analysis of fiscal transparency.⁷ For the present study, we use the literacy rate of adults, as the variable of interest. It is the percentage of people aged 15 and above who can read and write simple texts. The data are drawn from World Development Indicators (2011).

⁶ See the Dar Es Salaam Declaration on Budget Transparency, Accountability, and Participation (November 18, 2011).

⁷ See Alt et al. (2002 and 2006) or Bernardino and Bastida (2009).



Note: All countries in the sample are ordered in terms of the indicator of the literacy rate and of the index of fiscal transparency. Then, all the data were sorted according to the literacy rate.

Figure 2 depicts the relationship between the literacy rate of the population and the index of fiscal transparency, in terms of the ranking of the countries of the sample. According to Figure 2, there is a weak positive link between the rankings of countries based on both the literacy rate and the index of fiscal transparency, which weakly confirm our a-priori reasoning. Some countries with higher literacy rates also have higher indices of fiscal transparency. This is the case for Ukraine, Moldova, Macedonia or Bulgaria. At the low end there are also countries like Cameroon, Mozambique or El Salvador, with lower literacy rate that also display low indices of fiscal transparency. The empirical analysis presented below provides a clearer idea of the nature of that relation.

4.1.4. Openness and Fiscal Transparency

This section turns to the relationship between openness to trade and capital movements and fiscal transparency. These links have not yet received attention in the literature. It has been shown that capital mobility and trade openness enhance fiscal effectiveness, in terms of budget-deficit reduction. Countries which have implemented openness policies are better able to face external shocks brought by that

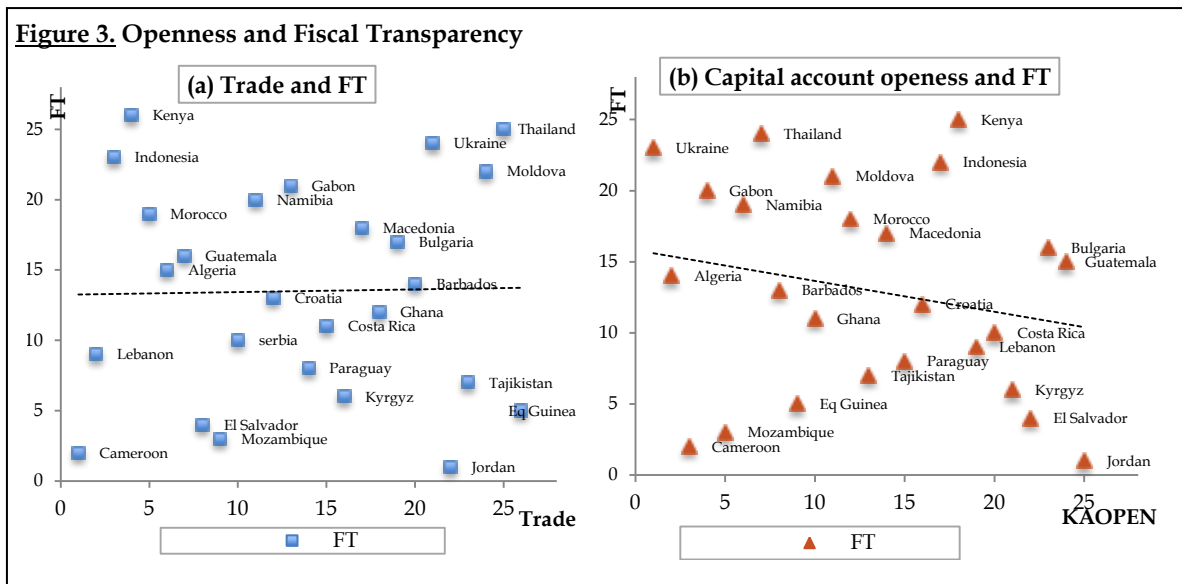
openness. That is, they have higher resilience in terms of disciplined budgets. In their study of the impact of trade openness on budget balance, Combes and Saadi-Sedik (2006) make a distinction between natural openness (exports plus imports of goods and services as a percentage of GDP) and trade-policy-induced openness which corresponds to the removal of barriers against international trade. Natural openness is determined by the fitted value derived from a regression of actual trade openness on some structural variables, and the residuals. Countries that are not naturally open are more corrupt because of available rents; while openness, as a policy, leads to less corruption, to potentially sounder budget systems and to more efficient fiscal administrations.

This attempts to connect a country's openness to its performance in terms of fiscal transparency. Openness to international trade and capital movements helps foster fiscal transparency because it reduces the costs and increase the benefits of fiscal transparency since trade openness leads to increased competition and economic growth, while international capitals encourage efficient economic environments. Both economic aspects of openness are considered here: trade and capital account openness.

For trade openness, we use the sum of exports and imports of all goods and market services as a share of GDP. The data used are provided by World Development Indicators (2012). For capital account openness, the Chinn-Ito (2008) index, *KAOPEN*, is used. This is based on binary dummy variables that codify the restrictions on cross-border financial transactions reported in the IMF's *AREAER*.⁸ Other indicators of capital account openness exist in the literature. For instance, Quinn (1997, 2003) has compiled a composite index based upon his coding of qualitative information from texts in the various issues of *AREAER*, taking into

⁸ In 1997, *Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER)* started publishing the data on disaggregated components of capital controls, with the specification of thirteen categories including, for the first time, a distinction between restrictions on inflows and outflows as well as between different types of capital transactions.

consideration whether the country has entered into agreements with international organizations such as the OECD and the European Union. Despite the merits of the Quinn index, at the time of writing this paper, this dataset is not publicly available. While containing overtime variation and focusing on the intensity of capital controls, KAOPEN has the widest coverage of countries and time periods among indices measuring financial openness.



Note: All countries in the sample are ordered in terms of the indicator of the value of imports plus exports as share of GDP and of the KAOPEN index. These ordering are then compared to that in terms of the index fiscal transparency. In the graph on the left hand side all the orderings of openness and of FT index were sorted according to the trade openness value, and on that on the right hand side, the orderings of KAOPEN and of FT index are sorted according to KAOPEN

Figure 3 compares countries based on each of the indicators of openness and the corresponding index of fiscal transparency. The relationship between trade openness and fiscal transparency does not provide a strong support to our a-priori reasoning. Trade openness does not seem to be linked with the index of fiscal transparency. One reason is that the natural resources, as defined above, often constitute the biggest share of the exports of many developing countries. Therefore, the level of trade does not appear to affect the effort to promote fiscal transparency, since the management (operation and exportation) of natural resources remains a private affair between the political authorities and the companies approved. That is

the reason why countries like Equatorial Guinea, Jordan and Tajikistan have higher levels of trade openness while their indices of fiscal transparency are lower compared to the rest of the sample. However capital openness seems to be negatively associated with the index of fiscal transparency, in opposition with our expectations. Some countries, which are relatively less open in terms of capital mobility like Ukraine, Thailand, Gabon, Namibia, Moldova, have higher indices of fiscal transparency, while others like Jordan, El Salvador, or Kyrgyzstan have higher indices of capital account openness associated with lower indices of fiscal transparency. Once again, even though these graphs do not provide support to our predictions, we rely on the reasoning to keep openness to trade and openness to capital in the specification of our model.

4.2. Control Variables

Following the literature, we control for several socio-economic variables such as the unemployment rate, the Business Disclosure Index, GDP per capita, armed forces, and the number of updates of the ROSC. Indeed, unemployment can be taken as a potential indicator of government policy. It indicates whether the government is using its authority to ensure jobs through fiscal expansion or by changing regulations to promote small business. Unemployment negatively impacts the government's ability to generate income and also tends to reduce economic activity. When unemployment is high, fewer people are paying taxes to the government. At the same time, unemployment means there are fewer people with disposable income to spend on goods and services, which dampen economic growth. This could lead to lower incentive for the government to disclose fiscal information. Either because of the lower political importance of fiscal policy or because of the low financial gains as government revenue is low.

For the business disclosure index, it measures the extent to which private actors are protected through disclosure of their ownership and financial information. This variable is used as a proxy of transparency of private sector. We believe in this paper that transparency in public activities should go along with the transparency in

the private sector, at least in order to ensure significant detailed information about the procurements and resulting contracts issued by government bodies. In other words, if every private company is subject to the application of transparency, as least when the compagny is carrying out government contracts such as proposed by Di Ianni (2011), this may lead to the improvement of the overall government transparency.

Armed forces variable is the number of military personnel, including paramilitary forces out of the population of the country. It is used here as a measure of the power that the political regime has at the expense of freedom of expression. So, we believe that important armed forces can be associated with less transparent government's policies for at least two reasons: First, the important is the armed forces, the higher might be the oppression of the protected government over the population, preventing the civil society from holding the government accountable for the outcomes of its policy. Second, important armed forces might be associated with too high and opaque government spending on military equipment.

The GDP per capita is used to control for relative differences in the levels of development in the sample. Several studies such as Jarmuzek et al. (2006) or Andreula et al. (2009) have found that developed countries display higher indices of fiscal transparency compared to developing ones. As summarized by Khagram et al (2012), few empirical studies have found the level of development (per capita income) to be strongly related to various measures of transparency⁹. In fact, the improvement of education as well as the expansion of middle classes may give rise to higher pressures for transparency, as better-off citizens come to desire greater quality and efficiency in the provision of public goods and gain the resources to express that interest politically, as supported by Bellver and Kaufmann (2005) and in IBP report (2013).

The ROSC update is the number of times that the performance of a country has been assessed by IMF Officers. As we mentioned earlier, a few countries in the sample, including Mozambique, Bulgaria, Cameroon, El Salvador, Indonesia,

⁹ See sanjeev khagram, paolo de renzio, and archon fung (2012).

Kyrgyzstan and Ukraine, have updated their ROSCs at least once. But the updated ROSCs are very short summaries that cannot be used to rate these countries again. However, we use the number of updates as an indicator of the engagement of the country toward promotion of fiscal transparency, following Hameed (2005). We expect it to positively affect fiscal transparency.

All the data are drawn from world Development indicator (2012) except the ROSC updates which are available on the IMF website.

4.3. Empirical Model

The empirical analysis aims to analyse the determinants of fiscal transparency. The objective is to examine the effects of natural resources, quality of institutions, literacy rate and openness to trade and capital movements on fiscal transparency. Following Alt and Lassen (2006), and Andreula et al. (2009), the empirical model could be presented as follow:

$$FT = f(\text{Natural Wealth}, \text{Institutions Quality}, \text{Literacy}, \text{Openness}) \quad (3)$$

where FT, the fiscal transparency index is a function of *Natural Wealth*, *Quality of the Institutions*, *literacy rate* and *Openness* -which is the vector of two measures of a country's openness: capital account openness (KAOPEN) and trade openness (Trade).

The regression model is therefore specified as follows:

$$FT_i = b_0 + b_1 \text{Natrc}_i + b_2 \text{RQ}_i + b_3 \text{Litr}_i + b_4 \text{KAOPEN}_i + b_5 \text{Trade}_i + b_6 Z_i + e_i \quad (4)$$

Z_i is the vector of socio-economic control variables

Equation 4 will be evaluated by means of parametric correlation analysis. Because our index of fiscal transparency does not have time variation, we cannot apply panel data analysis. Our empirical model is tested by the mean of cross-sectional analysis. Multivariate analyses such as ordinary least squares regressions

will be applied to test the relationship between the selected variables and transparency.

Besides this constraint, another important theoretical issue is that of the potential endogeneity nature of fiscal transparency, considered as an institutional variable and most of the explanatory variables. It means that the explanatory variables, on the right-hand-side of the equation (4), which are seen as determinants can also be outcomes of fiscal transparency (the dependant variable on the left-hand-side). In fact, the idea of equation (4) is that socio-economic conditions can influence public governance but at the same time public governance drives economic conditions. In the above specification the key variables retained as affecting fiscal transparency are Natural wealth, Quality of institutions, literacy rate and country's openness. However, one can imagine a situation in which this also works in the opposite way. For example, fiscal transparency may provide framework for a country to implement an efficient exploitation of its natural resources.

In the institutional literature, the primary strategy for dealing with endogeneity problem is to use instrumental variables to ensure that the estimators are consistent. One of the easier ways to do this is the two-stage least squares (2SLS) method. This method is a special case of the generalized instrumental variable estimation. The procedure should commence from an estimation of the reduced form (equation (4)) by OLS.

Given that, in the first step of the 2SLS method, our explanatory variables of interest that are likely endogenous are regressed on their determinants or instrumental variables. The crucial condition for choosing instrumental variables is that they have to be correlated with the endogenous variables, but not with the error term of the underlying model¹⁰. We regressed natural resources on national income; Regulatory Quality on Human Development Index (HDI); literacy rate on HDI and population

¹⁰ However, the validity of instrumental variables can be tested if and only if the system is over-identified, which means a situation in which the number of endogenous variables is less than the total number of variables excluded from the equation under consideration. Otherwise the only feasible option is to rely on economic theory or intuition (Verbeek, 2004).

density; trade on national income and growth rate of the population; capital account openness on national income and inflow of foreign aid. In the second step, we estimated the original equations, but each endogenous variable of interest located on the right hand side is replaced with its predicted values from the reduced form (regression on instrumental variables). However, rather than taking all the endogenous variables in a unique model, we specified five different models where only one of the above explanatory variables of interest is included, and the index of fiscal transparency remains the dependant variable. This allows us to avoid any multicollinearity problems, because some of the endogenous variables have the same instrument, as discussed above. That led to five estimations with OLS. In some cases we used different control variables in order to get the best fit of the models. We ended up with five estimations using two-stages least squared.

Since the theoretical and empirical work on the issue of fiscal transparency is still in its nascent phase, a thorough technical analysis of the determinants of fiscal transparency is constrained by the factors that we mentioned above. Indeed, the absence of time variation in the data and potential existence of endogeneity make it difficult to claim causality between performance variables listed above and fiscal transparency. But it is still useful to show correspondence between them.

5. Results

Results of the general model of the determinants of fiscal transparency are presented in Table 6. In addition to using the aggregate fiscal transparency index FT, each of the four sub-indices is used as the dependant variable. The objective is to analyse the channel through which the retained potential factors determine fiscal transparency.

The results show that, taken together, some of the retained factors have significant coefficients. The coefficients of natural resources and openness to trade are not statistically significant, while the coefficient associated with capital account openness is statistically significant. The relationship between both variables of

openness and the index of fiscal transparency seems to be negative, which is different from our expectations, but the sign of the coefficient of KAOPEN confirms the trend in figure 3. The coefficients associated with natural resources, regulatory quality and literacy rate have the expected signs.

Table 6. Determinants of Fiscal Transparency

Variables	(1) FT	(2) BS	(3) BO	(4) BP	(5) EBA
Natrce	-0.002 (0.25)	-0.015 (0.75)	-0.018 (0.9)	-0.029* (2.07)	0.042** (3.00)
KAOPEN	-0.0462* (1.92)	-0.0229 (0.51)	-0.0919** (2.62)	-0.0415* (1.73)	-0.035 (0.95)
Trade	-0.016 (1.6)	-0.012 (0.86)	-0.002 (0.1)	-0.02 (1.43)	-0.027 (1.50)
RQ	0.100* (2.05)	0.0762 (0.76)	0.114 (0.91)	0.1035 (1.45)	0.1038 (1.33)
Literacy	0.005** (2.27)	0.0064 (1.6)	0.0038 (1.27)	0.0048 (1.60)	0.0048 (1.33)
Busdisclo	0.076 (0.95)	0.039 (0.26)	0.003 (0.018)	0.092 (1.02)	0.166 (1.11)
Armforce	-0.0236* (2.14)	-0.0318* (2.12)	-0.042* (1.99)	-----	-0.0023 (0.10)
Roscupd	-0.0327 (1.56)	-----	-----	-0.0519** (2.26)	-----

***, **, * denote significance at 1 %, 5 % and 10 % levels, respectively. Numbers in bracket are t-statistics calculated with robust standard errors.

Before applying the 2SLS method, a Durbin–Wu–Hausman (DWH) test for endogeneity was performed as recommended by Davidson and MacKinnon (1993).¹¹ Even though the test did not reveal that all the coefficients of the OLS models were inconsistent, the intuition presented above is the reason for conducting another set of model estimations using the 2SLS method whose result are presented in table 7.¹²

¹¹ Davidson and MacKinnon (1993) suggest an augmented regression test (the Durbin–Wu–Hausman test), which can easily be formed by including the residuals of each endogenous right-hand side variable, as a function of all exogenous variables, in a regression of the original model.

¹² The results are not presented, but in general the inconsistency was observed in two of the five models, that is the coefficients associated with residuals of RQ and Natrce were

Table 7. Two Stage Least Squares models of the determinants of Fiscal Transparency

Variables	(1) FT	(2) BS	(3) BO	(4) BP	(5) EBA
Natrcce	-0.04** (2.01)	-0.046* (1.820)	-0.054 (1.085)	-0.027 (0.174)	-0.010*** (3.013)
RQ	0.088* (1.91)	0.085 (0.952)	0.022 (0.097)	0.151** (2.072)	0.013 (0.545)
Literacy	0.04* (1.78)	0.006** (2.210)	0.003 (0.710)	0.003 (0.930)	0.003 (0.760)
KAOPEN	-0.504*** (3.93)	-0.475** (2.030)	-1.220*** (2.422)	0.142 (0.327)	-0.527** (0.198)
Trade	0.011*** (1.83)	0.008** (2.030)	0.020*** (2.403)	-0.002 (0.637)	0.009** (2.013)

* Significant at 10%; ** significant at 5%; *** significant at 1%, Column (1) includes the models where FT is the dependent variable. Columns (2) to column (5) include the models where the dependent variables are respectively BS, BO, BP, and EBA. Each predicted variable of interest was used in a specific 2SLS model. Therefore, in this table each coefficient represents a model. In addition to the above explanatory variables, these models include Unemployment rate, Business disclosure rate, Arm force, number of Rosc updates as additional control variables.

The sign of the coefficient associated with natural resources is still negative as expected, meaning that the relationship between the natural wealth and fiscal transparency is negative. In other words, under certain conditions natural resources can be a limit to improving fiscal transparency practices. In order to achieve high levels of transparency in developing countries, efforts should be made on the transparency of using natural resource, other things being equal. So any Fiscal Transparency program should go along with programs such as Extractive Industries Transparency Initiative (EITI), also initiated by the International Monetary Fund and World Bank Group. The sign of the coefficient of RQ is positive as expected; meaning that good quality of the institutions is associated with high levels of fiscal transparency, other things being equal. This result is in line with the findings of Andreula et al. (2009), who showed that there is a causal positive relationship

significantly different from zero, which should assume that previous OLS estimation including these variable is not consistent.

between quality of the institutions and fiscal transparency, in the case of developed countries.

Results also show a negative relationship between the capital account openness and fiscal transparency. The association is stronger in the 2SLS models (Table 7). Capital inflows seems to be intended for exploitation of natural resources, which is based on generally subjective and less transparent contracts; while outflows leak to secret accounts in developed countries or intended for financing military equipment. The 2SLS estimation shows a positive and significant relation between openness to international trade and fiscal transparency, while the OLS estimation displayed a negative relation, which makes the relationship ambiguous.

Literacy rate has a positively and statistically significant relationship with fiscal transparency. This means that countries with high literacy rates also have good levels of fiscal transparency, other things being equal. High literacy rate of the population leads to strong communities, civil society and groups of pressure that demand access to information and participation in decision-making. The introduction of the number of updates of the ROSCs leads to poorer results everywhere. It means that the number of assessment of the country's practice of fiscal transparency is not an indicator of its performance. In other words, it shows that we should not consider the number of ROSCs published, as Glennerster and Shin (2003) did earlier, as an indicator of the level of fiscal transparency.

6. Robustness checks

To check whether the results are sensitive to how fiscal transparency is measured, we used other indices to estimate the same models specified above.¹³ In this regard, we use the fiscal transparency index constructed by Andreula et al. (2009)

¹³ The use of other indices in the same specification of the model allows for testing the consistency of our result, given that these selected indices are not perfectly correlated with our constructed index.

as well as the average of the Open Budget Index.¹⁴ We could not consider other indices that exist in the literature because the numbers of countries that we have in common is too small. In order to obtain comparable coefficients, we adjusted the range of all the retained indices to be from 0 to 10.

Table 8. Determinants of fiscal transparency: Robustness check using other indices

Variables	Andrula et al.					
	FT		(2009)		OBI	
	OLS	2SLS	OLS	2SLS	OLS	2SLS
Natrce	-0.002 (0.25)	-0.04** (2.01)	-0.025** (3.03)	-0.065* (2.37)	-0.025** (3.03)	-0.08 (1.02)
KAOPEN	-0.462 (1.92)	-5.04*** (3.93)	-0.518* (2.36)	0.703** (3.12)	-0.518* (2.36)	2.712** (3.94)
Trade	-0.016 (1.60)	0.011* (1.83)	0.001 (0.12)	-0.01** (3.12)	0.001 -0.12	-0.036** (3.94)
RQ	1.00* (2.04)	0.088* (1.91)	0.765 (1.51)	0.755** (3.12)	0.765 (1.51)	2.913** (3.94)
Literacy	0.05** (2.27)	0.04* (1.78)	0.039* (2.17)	0.038* (2.26)	0.039* (2.17)	0.077* (2.45)

* Significant at 10%; ** significant at 5%; *** significant at 1%. Column (1) and (2) include the models where FT is the dependent variable. Columns (3) to Column (6) include the models where the dependent variables are the index constructed by Andrula et al. (2009) and a 3-years average of the IBP index. Each variable was used in a specific 2SLS model. Therefore, in this table each coefficient represents to a model. In addition to the above explanatory variables these models include Unemployment rate, Busdisclosure rate, Arm force, number of Rosc updates as controls (The sources for each variable are discussed in the text.)

¹⁴ International Budget Partnership provides indices of budget transparency, called Open Budget Index (OBI) every two years. But two things prevent us from running a panel data analysis for robustness check: the lack of data concerning some countries of our sample, and the fact that a panel data analysis cannot be used as a robustness check of the initial cross-sectional analysis.

As depicted in Table 8, results of the robustness check show that our findings are consistent with what the other indices predict. Definitely, with a few exceptions mostly regarding the sizes and the significance of the parameters, the directions of the relationship tend to be similar. For example, the variable of natural resources is still negatively associated with all the indices of fiscal transparency. The coefficient is larger when we use the Andreula et al. (2009) index. The relationship between capital account openness, trade and OBI are ambiguous, as the signs change from the OLS to the 2SLS models. The same thing holds with the Andreula et al. (2009) index in the case of capital account openness. For the rest, all the signs are consistent with our results. The significance of the relationship between quality of institutions, trade, and the level of fiscal transparency is stronger with both these indices, while the significance of the relationship between fiscal transparency and the literacy rate of the population is weaker than what the model predicts with our index.

7. Conclusion

The objective of this paper was to propose an answer to the question raised in several earlier studies about what factors determine fiscal transparency in developing countries. We contribute to the existing literature by analyzing some economic factors, including natural wealth and openness, and non-economic factors, such as the quality of institutions and literacy level of the populations, in their relation with fiscal transparency.

In this paper, we used the reports of adherence to the Code of Good Practices on Fiscal Transparency to construct a new and replicable index of fiscal transparency, inspired by Hameed (2005), Jarmuzek et al (2006) and Andreula et al. (2009). The index is used to investigate the relationship between the above factors and fiscal transparency. Initially the OLS was applied, but because of the potential endogeneity nature of fiscal transparency, we also applied the Two-Stage Least Squares method to ensure that the estimators are consistent. That led to some changes in the magnitude and the statistical significance of the variables, but to very few changes in the sign of the coefficients. Results of the multivariate analyses reveal that the level of natural

resources and openness of the capital account are negatively associated with fiscal transparency. Also, good quality of institutions tends to go along with good practices of fiscal transparency, even after controlling for important socio-economical factors. In addition, results also show that the level of literacy of a population is positively associated with the country's level of fiscal transparency, confirming the prediction of some international organizations that call for budget transparency, according to which higher literacy rate of the population is a conditional criteria for having a strong civil society, which can play a role for budget transparency. However, the paper does not provide evidence of a relationship between openness to international trade and fiscal transparency, as the sign changes from the OLS to the 2SLS estimations.

As a robustness check, we used the index proposed by Andreula et al. (2009) and the Open Budget Index, two commonly used indices in the literature, that share a significant sample of countries with our index. We simply replace our index with these indices in the estimation of the same models of our specification, applying both the OLS and the 2SLS methods. Apart from slight differences in the sizes of the coefficients, the significance and the signs of the relationships are almost the same as what was predicted using our index.

One of the limitations of the current study is its cross sectional nature which stems from the lack of a time-series dimension for the fiscal transparency index. For that end, the replication of our index is possible if the countries are reassessed every 4 years as planned by the IMF and the World Bank, and if the updated ROSCs are written and structured like their first versions. Also, an important direction for future research would be to examine the outcomes of fiscal transparency practice for developing countries. Examples include its impact on education, health or economic growth.

References

- Alesina Alberto F. and Roberto Perotti (1999) Budget Deficit and Budget Institution. NBER Chapters, in: Fiscal Institutions and Fiscal Performance, pages 13-36 National Bureau of Economic Research, Inc.
- Allan W. and T. Parry (2003) Fiscal Transparency in EU Accession Countries: Progress and Future Challenges, IMF Working Paper 03/163 (Washington: International Monetary Fund).
- Alt J. E. and D. D. Lassen (2005), "The Political Budget Cycle is Where You Can't See It: Transparency and Fiscal Manipulation," New Political Economy Paper, April 16.
- Alt J. E., and D. D. Lassen (2003), "Fiscal Transparency and Fiscal Policy Outcomes in OECD Countries," Economic Policy Research Unit Working Paper, No. 2003-2.
- Alt, J. E. and David D. Lassen (2006), "Fiscal transparency, political parties and debt in OECD countries". European Economics Review, 50, 1403 – 1439
- Alt, J. E., David D. Lassen, and Rose Shanna (2006), "The Causes of Fiscal Transparency: Evidence from the American States", IMF Staff Papers Vol. 53, Special Issue.
- Andersen A.L. and Nielsen L.H.W. (2010), "Fiscal Transparency and Procyclical Fiscal Policy", EPRU Working Paper Series 2010-01
- Andreula Nicoló, Alberto Chong and Jorge Guillén (2009), "Institutional Quality and Fiscal Transparency", Inter-American Development Bank (IDB) working paper series No. IDB-WP-125.
- Benito B. and F. Bastida (2009), "Budget Transparency, Fiscal Performance, and Political Turnout: An International Approach", Public Administration Review, 69: 403–417.
- Bernoth K. and G.B. Wolff (2008), "Fool The Markets? Creative Accounting, Fiscal Transparency And Sovereign Risk Premia", Scottish Journal of Political Economy, Vol. 55, No. 4, pp. 465-487
- Carbonnier G. (2007), "Comment conjurer la malédiction des ressources naturelles?", Annuaire suisse de politique de développement, Vol. 26, n°2 (2007).
- Chinn M. and H. Ito (2008), "A New Measure of Financial Openness," Journal of Comparative Policy Analysis, 10 (3), p. 309 - 322.
- Christofides C., C. Mulder, and A. Tiffin (2003), "The Link Between Adherence to International Standards of Good Practices, Foreign Exchange Spreads, and Ratings," IMF Working Paper WP/03/74.
- Combes J-L, T. Saadi-Sedik (2006), "How Does Trade Openness Influence Budget Deficits in Developing Countries?" In IMF eLibrary, IMF Working.
- Davidson R. and J. G. MacKinnon (1993), "Estimation and Inference in Econometrics", New York, Oxford University Press, 1993. ISBN 0-19-506011-3.
- De Simone E. (2009), "The concept of budget transparency: between democracy and fiscal illusion", XXI Riunione scientifica SIEP Public Choice e Political Economy, Preliminary draft.

- Drabek Z., and W. Payne (2001), "The Impact of Transparency on Foreign Direct Investment," Staff Working Paper ERAD-99-02.
- Ellis C. J. and J. Fender (2006), "Corruption and transparency in a growth model", *International Tax and Public Finance*, 13(2 - 3), pp. 115 - 149
- Fox J. (2005), "Government Transparency and Policymaking", *Public Choice*, Volume 131, Numbers 1-2 23-44,
- Gavazza, Alessandro and Alessandro Lizzeri (2005), "Transparency and Economic Policy". Working paper, New York University.
- Gelos, R. G and S-J. Wei (2005), "Transparency and International Portfolio Holdings", *the journal of finance* • vol. lx, No. 6.
- Glennerster R. and Y. Shin (2003), "Is Transparency Good for You and Can the IMF Help?", IMF Working Paper 03/132
- Guerrero J. P. and H. Hofbauer (2001), "Index of Budget Transparency in Five Latin American Countries: Argentina, Brazil, Chile, Mexico, and Peru", International Budget Project.
- Hameed F. (2005), "Indices of Fiscal Transparency" (unpublished; Washington: International Monetary Fund).
- Harvey G. J. (1991), "The Legacies of Literacy: Continuities and Contradictions in Western Culture and Society". Bloomington: Indiana University Press, 1991.
- International Monetary Fund (2003), "Assessing and Promoting Fiscal Transparency: A Report on Progress." Washington, DC, United States: IMF. Available at: <http://www.imf.org/external/np/pdr/sac/2003/030503s2.pdf>.
- International Monetary Fund (2007), "Revised Code of Good Practices on Fiscal Transparency." Washington, DC, United States: IMF. Available at <http://www.imf.org/external/np/pp/2007/eng/051507c.pdf>.
- Jarmuzek M., E. K. Polgar, R. Matousek, and J. Hoelscher (2006), "Fiscal Transparency in Transition Economies", CASE Studies and Analyses No. 328.
- Kaufmann D., A. Kraay and P. Zoido-Lobaton (2002), "Governance matters II - updated indicators for 2000-01," Policy Research Working Paper Series 2772, The World Bank
- Kopits, G. and J. Craig (1998), "Transparency in government operations", IMF occasional paper 158.
- Milesi-Ferretti G. M. and K. Moriyama (2004), "Fiscal Adjustment in EU Countries: A Balance Sheet Approach", IMF Working Paper No. 04/143, August 01.
- Parry T. (2007), "The Role of Fiscal Transparency in Sustaining Stability and Growth in Latin America", IMF Working Papers, Vol., pp.1-44.
- Prat A. (2005), "The Wrong Kind of Transparency." *American Economic Review* 95, 862- 77.
- Ross M. (2011), "Mineral Wealth and Budget Transparency." Los Angeles: UCLA.
- Shi M. and J. Svensson, (2006), "Political Budget Cycles: Do They Differ Across Countries and Why?", *Journal of Public Economics*, 90 (8–9), 1367–1389.
- Verbeek M. (2004), "A Guide to Modern Econometrics", 2nd edition, John Wiley & Sons, Ltd.,

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