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Working Papers

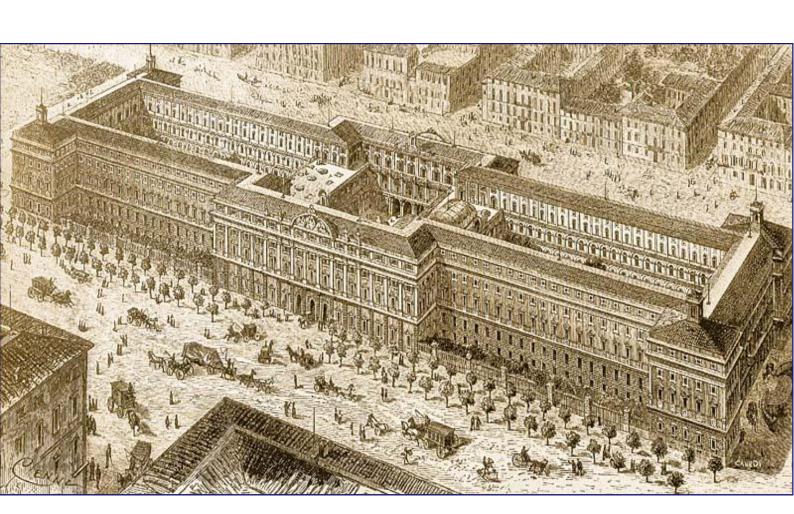The working paper series promotes the dissemination of economic research produced in the Department of the Treasury (DT) of the Italian Ministry of Economy and Finance (MEF) or presented by external economists on the occasion of seminars organized by MEF on topics of institutional interest to the DT, with the aim of stimulating comments and suggestions.
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Measurement of Base Erosion and Profit Shifting phenomena through the analysis of FDI stocks

Paolo Acciari[1], Francesca Tomarelli[1], Laura Limosani[2], Laura Benedetti[2]

Abstract

This work is intended to provide a useful contribution to the OECD-G20 project to address the issue of international tax avoidance by multinational corporations, known as Base Erosion and Profit Shifting (BEPS), focused on the issue of "how big a problem is BEPS".

The main difficulties encountered in the assessment of the scale and impact of Base Erosion and Profit Shifting stem from: i) the variety and complexity of the tax planning strategies exploited by multinational corporations to reduce their corporate tax burden; ii) the lack of complete and reliable worldwide corporate micro-data sources; iii) the absence of an exhaustive tax variable to identify a low-tax system, since neither the statutory tax rate nor the different specifications of the effective tax rates are sufficiently accurate for this purpose. The assessment strategy described in this work tries to overcome the aforementioned difficulties by basing the analysis on inward FDI stocks for a wide set of countries, leading to an indirect identification of foreign direct investments that are driven by BEPS phenomena as those FDI stocks that are not justified by economic reasons.

With particular attention to the consistency and quality of the recorded information, the econometric analysis performed makes use of a database constructed with information provided by different data sources (UNCTAD, The World Bank, International Telecommunications Union International Labour Organization, Transparency International, WTO, UNESCO, IMF, WGI) for the years 2005-2012, and available for a set of 172 countries. The data used for each country refer to structural and context variables identified in the economic literature as FDI determinants, such as: gross domestic product (GDP), infrastructures, labour market, degree of openness to foreign markets, inflation, etc.

Through the application of a mixed model on repeated observations, it was possible to identify an econometric function to obtain a point estimate of the inward FDI stock for each country. This point estimate displays two components: a fixed effect (for all countries), regarding the structural and context variables identified in the model, and a variable intercept with a random effect, which captures the individuality of each country in that it explains the differences

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linked to the exploitation of favourable tax systems, to incentive policies targeted at foreign investors, or to other aspects that are not directly captured by the explanatory variables in the fixed part of the model. Therefore, positive intercepts identify those countries attracting a greater amount of foreign direct investments, and are a proxy of the share of inward FDI stocks at risk of BEPS.

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1   INTRODUCTION

This work is intended to provide a useful contribution to the OECD-G20 project to address the issue of international tax avoidance by multinational corporations, known as Base Erosion and Profit Shifting (BEPS). For years, BEPS issues have been high on the agenda of governments and tax administrations: there has been a growing perception that governments lose substantial corporate tax revenues because of aggressive tax-planning strategies, such as *transfer pricing* and *dividend washing*, through which multinational corporations erode their taxable base by shifting profits to locations where they are subject to very low taxation.

These tax-avoidance schemes pose an even more serious threat in a period which is still characterized by the effects of financial distress following the crisis of 2007-2008, with particular reference to those countries that are facing significant budget constraints and need to restore their public finances.

BEPS issues have also worsened as a result of globalization: as the economy becomes more globally integrated, multinational corporations find it much easier to shift the location of their activities and profits from one country to another, and take an aggressive tax position.

Therefore, given a context of growing global concern over BEPS issues, in 2013 the OECD published the first report on "Addressing Base Erosion and Profit Shifting[3]", underlining that a "new" holistic approach is necessary to properly deal with the threats posed by BEPS issues. This represents a change for the better in the approach to addressing the BEPS phenomena, according to which governments' actions should be comprehensive and deal with all the different aspects of BEPS in a coordinated and globally-supported way. A multilateral approach is now necessary because the aggressive tax-planning strategies exploited by multinational corporations involve multiple tax jurisdictions, making it clear that any effective and long-term solution to the BEPS problem should not be based on isolated interventions, but on coordinated measures involving the different countries affected by the BEPS phenomena.

Later on, the G20 finance ministers called on the OECD to develop an Action Plan to address BEPS issues in a coordinated and comprehensive manner, starting from a general definition of BEPS: "*BEPS relates chiefly to instances where the interaction of different tax rules leads to double non-taxation or less than single taxation. It also relates to arrangements that achieve no or low taxation by shifting profits away from the jurisdictions where the activities creating those profits take place[4]*".

Specifically, the OECD Action Plan on BEPS provides countries with domestic and international instruments that will better align rights to tax with economic activity, with a view to addressing the perceived flaws in international tax rules. It identifies 15 separate action points[5] or work streams that are needed to address Base Erosion and Profit Shifting, and sets timelines for the implementation.

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[3] OECD (2013a).

[4] OECD (2013b), Action Plan on Base Erosion and Profit Shifting, OECD Publishing, page 10.

[5] For further information please see OECD (2013b). For a useful overview please see C&S Informa, volume 14, n. 5, year 2013.

The work described in the current paper comes within the scope of Action 11 – *Establish methodologies to collect and analyze data on BEPS and the actions to address it* – the action which is most characterized by an economical-statistical approach aimed at developing an economic analysis of the scale and economic impact of BEPS (including spillover effects across countries), and of the effectiveness and impact of the actions taken to address BEPS on an ongoing basis.

The work of Action 11 therefore involves the identification and assessment of a range of existing data sources, and the development of methodologies to measure the BEPS phenomena based on both aggregate (e.g. FDI and balance of payments data) and micro-level data (e.g. from financial statements and tax returns).

Indeed, measuring BEPS is a complex issue from different point of views: first of all, identifying all the different and complex tax-planning strategies exploited by multinational corporations to reduce their tax burden is definitely a hard task, making it difficult to quantify the scale of BEPS occurring through the different BEPS channels. Secondly, complete and reliable worldwide data sources on firm-level financial accounts are not available: currently available firm-level proprietary databases are not comprehensive in their coverage and not enough representative with particular reference to those multinational enterprises operating in low-tax countries. A further obstacle to measuring BEPS is represented by the absence of an exhaustive tax variable to quantitatively define a low tax system, given that neither the statutory corporate tax rate nor the different specifications of the effective tax rates are sufficiently accurate for this purpose.

The statutory tax rate alone cannot be considered to be a reliable indicator of the total corporate tax burden on businesses, as it does not take into account all the subtleties and different aspects of tax law that would determine the amount of tax actually paid by businesses, namely special tax regimes and tax measures affecting their taxable income, such as tax holidays, ad hoc arrangements, specific tax deductions or special depreciation regimes allowing an accelerated depreciation of fixed capital. In addition to this, the statutory corporate tax rate is not representative of all the complex tax-planning strategies exploited by multinational corporations to reduce their tax burden, that are at the core of the BEPS problem[6]. For these reasons, choosing it as the reference tax variable to identify a low tax system and assess the scale and spread of the BEPS phenomenon might lead to biased results.

Possible alternatives to the CIT statutory tax rate to be considered as tax variables of reference might be the effective tax rates. The distinction between backward-looking and forward-looking effective tax rates is based on the type of information used: backward-looking approaches use ex-post real-life data to estimate the tax burden that companies bear, whereas forward-looking approaches use statutory features of the tax system to model a hypothetical investment project and assess the tax aspects of specific investment decisions[7].

More specifically, the *backward-looking* effective tax rate, which is the ratio between the amount of tax actually paid by a business company and a measure of its gross reported profit (potential tax base) could be thought of as a more appropriate measure of the effective tax burden on businesses if confronted with the statutory tax rate, and can be calculated both as a

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[6] Cf. Clausing (2009), page 708 and IMF (2014) page 19.

[7] Nicodème (2001) page 6.

macro indicator based on national accounts data (i.e. the *implicit tax rates*[8] would be obtained in this case), or as a micro indicator based on firm-level or corporate-group financial accounts data[9]. And, indeed, the *backward looking* effective tax rate measure may be closer to what a company actually pays in tax as it indirectly captures all the factors determining the amount of tax actually paid (the numerator of the ratio), thus reflecting all aspects of the corporate tax system. But the problem is that the amount of reported profits (the denominator of the ratio) can be influenced by BEPS practices (e.g. via transfer pricing) that reduce the amount of reported profits in high tax countries, and that is why the *backward-looking effective tax rate* is often an inexact measure of the effective tax burden on businesses.

Not even a tax variable such as the *forward-looking*[10] effective tax rate could be an appropriate indicator, as the proposed approaches to calculate the tax rate (following the King-Fullerton and Devereux-Griffith[11] methodologies) do not take into account all the specific tax avoidance practices that matter from a BEPS perspective and that, for instance, make use of hybrid instruments (*hybrid mismatch arrangements*) or refer to complex strategies of cross-border tax planning (*tax-treaty shopping*) exploited by multinational corporations.

Similarly it does not appear accurate to use as a variable to define a low tax system any qualitative variable based on the perception of the tax system by an economic operator. As an example, the annual Global Competitiveness Report published by the World Economic Forum contains a variable named "Extent and effects of taxation"[12], which represents the average of the answers to the question: "*In your country what impact does the level of taxes have on the incentive to work and to invest?*" (possible answers are from 1 to 7). The question is submitted, as a part of a comprehensive questionnaire, to executives of private companies. As this variable might be useful for the purposes of the report, it has to be acknowledge that it clearly depends entirely on the perception of the respondent, who has hardly enough expertise in international business taxation to correctly compare the tax system of his country with that of other countries.

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[8] Please see European Commission (2014) and Schmidt-Faber (2005).

[9] E.g. see Nicodème (2001)

[10] The forward-looking approach comprises two different indicators: the "marginal effective tax rate" and the "average effective tax rate". The first indicator is based on the notion of the "cost of capital" and synthesizes the amount of tax which is expected to be due on the returns of a hypothetical marginal investment, i.e. an investment barely covering its costs (including the "normal profit", i.e. the return the entrepreneur could obtain from a suitable investment alternative). More specifically, the marginal effective tax rate is the difference between the gross and net returns on the marginal investment, usually expressed as a percentage of the gross return. However, in recent times both the academic literature and the empirical evidence focused on a second indicator, the "average effective tax rate", synthesizing the amount of tax which is expected to be due on the returns of a hypothetical infra-marginal investment, i.e. an investment that could generate profits in excess of the "normal profit". It follows that there will be as many average effective tax rates as the assumed return levels for the investment.

[11] Devereux M. P., Griffith R. (1998); ZEW – Centre for European Economic Research (2012).

[12] As of Edition 2013-2014 the variable has been split in two variables,"Effect of taxation on incentives to invest" and "Effect of taxation on incentives to work". Cf. World Economic Forum (2015).

2   MEASUREMENT APPROACH BASED ON INWARD FDI STOCKS

The current work implements an estimation strategy to indirectly measure the scale of BEPS through macro data such as countries' inward FDI stocks. In the first place, the choice to use FDI data derives from the considerations reported in the OECD report on "Addressing Base Erosion and Profit Shifting", highlighting data that seem to provide strong evidence of the existence of BEPS:

[…] by searching through the IMF Co-ordinated Direct Investment Survey (CDIS), it emerges that in 2010 Barbados, Bermuda and the British Virgin Islands received more FDIs (combined 5.11% of global FDIs) than Germany (4.77%) or Japan (3.76%)[13].

The present work aims at going beyond this purely anecdotal evidence, investigating the relationship between FDI investments and BEPS. Furthermore, as IMF (2014) reports, "*patterns of FDI are impossible to understand without reference to tax considerations*"[14]. Indeed, the use of macro data is further supported by the outcomes of some analyses performed at the OECD level, highlighting a good degree of correlation between analytical results obtained through the use of micro balance-sheet data and results obtained from analyses conducted on macro FDI data. Better still, the limitations of the internationally available micro data cast doubt about the absolute superiority of using micro data in this kind of analyses, and make it desirable to use different estimation techniques. Consequently the *Public Discussion Draft* on BEPS Action 11 released for public consultation on April 2015, lists 6 indicators to assess and monitor BEPS, including an indicator (n.1) on concentration of foreign direct investment to GDP, arguing that abnormally high concentrations of FDI to GDP in a country or group of countries may provide an indication of BEPS[15].

In this regard, a new and interesting perspective has been recently provided by the work performed by UNCTAD (2015) on the relationship between FDI and BEPS, identifying FDI related to BEPS by basing the analysis on a list of tax haven-countries (as defined by the economic literature) and on FDI operated through Special Purpose Entities.

The purpose of the methodology adopted in the current work is that of deriving an indirect estimate of the scale of BEPS phenomena through the analysis of FDI determinants. To overcome the limits of the different tax variables that are available for use in the analysis, as discussed in the introduction, it does not use any tax parameter but instead provides a residual estimate drawing on the rich economic literature on FDI determinants.

Preliminarily, it is useful to clearly define what is a foreign direct investment, starting from the official definition included in the OECD Benchmark Definition of Foreign Direct Investment (2008):

"Direct investment is a category of cross-border investment made by a resident in one economy (the direct investor) with the objective of establishing a lasting interest in an enterprise (the direct investment enterprise) that is resident in an economy other than that of the direct

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[13] OECD "Addressing Base Erosion and Profit Shifting", 2013, page 17.

[14] IMF (2014), page 6.

[15] OECD (2015), page 32.

investor. The motivation of the direct investor is a strategic long-term relationship with the direct investment enterprise to ensure a significant degree of influence by the direct investor in the management of the direct investment enterprise. The lasting interest is evidenced when the direct investor owns at least 10 per cent of the voting power of the direct investment enterprise. Direct investment may also allow the direct investor to gain access to the economy of the direct investment enterprise which it might otherwise be unable to do. The objectives of direct investment are different from those of portfolio investment whereby investors do not generally expect to influence the management of the enterprise."

It follows from the OECD definition that foreign direct investments can be aimed at both acquiring a lasting shareholding in an existing foreign enterprise and also at establishing a foreign subsidiary. In detail, within the constitutive processes of FDI the following operations are of major importance:

- the so-called greenfield investments, where there is new injection of foreign capital and the creation of new production units in the receiving country;
- the acquisition of capital shares by the foreign investor in a company already existing in the receiving country;
- the re-investment of profits by the foreign investor in the receiving country;
- capital flows in the form of loans or debts between the parent company located in the country of the investor and the aforementioned companies in which the investment is made. This category includes investments realized to complement mergers and/or acquisitions processes of local companies by foreign corporations.

The last category of FDI is particularly important for the success of mass privatizations of public loss-making companies, as the investments provide new injections of capital that are highly useful for the development of the receiving country. Other forms of investments that grew up in recent years and are most used are franchising contracts and production licensing.

In a context of growing FDI flows at the worldwide level, there is a re-enforced need to analyze both the determinants that induce a business company to search for a captive market and the positive externalities stemming from this selection process. The analysis and study of FDI determinants suffer from the fair difficulty of taking into account all the macroeconomic, structural and policy factors that influence the phenomenon: e.g. think about the problem of translating into quantitative terms such elements as bureaucratic inefficiency or the presence of crime or social conflicts.

Furthermore, the factors that are normally at the basis of a country's "ability" to attract FDI (availability of skilled workers, presence of universities and of scientific research bodies, supply of land and buildings, proximity of transport infrastructures, financial support, quality of life, the degree of local concentration of services for businesses, etc.) can be reinforced by policymakers within countries, through targeted support programs carried out at different levels. However, it must be observed that the statistical indicators for such factors, though determinant in relation to FDI flows, can be "not significant" from the point of view of statistical analysis.

At the system level, the main factors determining the attractiveness of FDI by multinational enterprises are characterized by proximity and concentration economies, and by other variables such as market dimension, labour cost, interest rates, protectionist barriers, exchange rates,

openness to exports, market structure and stability of the political environment. The proximity advantage derives from scale economies at the company level, hence any knowledge capital can be transferred to the foreign affiliates allowing the multinational enterprise to be closer to the foreign market. Instead, the concentration advantage derives from the traditional scale economies at the plant and equipment level, making it more profitable concentrating production in a single location and serving the foreign market through exports.

The theoretical approach introduced by J.H. Dunning at the basis of a company's choice to make FDI investments is the main analytical reference for the current work, known also as OLI approach (Ownership, Location, Internalization). Multinational enterprises make a foreign direct investment when they simultaneously profit from: advantages linked to products or production processes that are not accessible to other companies (e.g. patents and intangibles, such as trademarks or business start-ups); advantages linked to the characteristics of the country of investment (location advantages) and internalization advantages, that are wider benefits obtained by internalizing in the company, through the acquisition of the supplying enterprise, different production stages that were previously carried out by foreign affiliates.

Given the production process of multinational enterprises, the main FDI determinants can be basically reduced to two: on the one hand, the input supplying markets (originating the so-called vertical or cost-saving FDIs) based on competitive advantages linked to the costs and quality in the acquisition of production factors); on the other hand, the markets for the distribution of products and services (originating the so-called horizontal or market-oriented FDIs).

Vertical or cost-saving FDIs determine delocalization procedures of different extents, that could involve markets where a tough technological competition is in place with a leader country, for those companies aiming at reaching excellence in production. This is, for instance, the case of FDI investments from Europe that are directed to the industrial districts at high technological concentration levels of the United States.

Horizontal or market-oriented FDIs instead determine the creation of sales structures in markets that are increasingly separated from the market of origin of the multinational enterprise. This kind of investments, typical of a downstream distribution mode of the production chain, highlight the existence of complex mutual causal links between commercial and financial flows related to FDIs, with the predominance, however, of a direct and often significant relationship between FDI and exports. This is an important element that underlines how instead FDIs, far from crowding out foreign sales, are often accompanied by their expansion, thus boosting the growth of the local economy through the foreign market multiplier.

2.1   Theoretical literature review on FDI determinants

The existing literature has already determined a comprehensive list of FDI determinants, ranging from the market dimension and risk factors level to the commercial relationships and exchange rates between origin and destination countries, labour cost and credit differentials, institutional factors – corruption index included – and also the level of taxation and the agglomeration factors, as a measure of human capital and of the infrastructural endowment of the receiving countries.

According to the analysis of the academic and empirical literature on FDI, the determinants

that have been used in this work to derive a point estimate of the FDI level in each country are the following:

- structure and attractiveness of the internal market;
- structure of the labour market, the availability of cheap labour force and skill levels;
- presence of natural resources and agricultural potential;
- presence and quality of infrastructures;
- transparency;
- real interest rate;
- inflation trend;
- openness to foreign markets.

Specifically, Drabek and Payne (1999) suppose a positive correlation between transparency and the level of inward foreign direct investments in each country, and show that the interest rate and inflation trend are likely to have a negative effect on the level of inward FDI.

In addition to this, in his work analyzing the ability of a country to attract FDI investments targeted at building export platforms, Kumar (2001) finds that the presence and quality of the physical infrastructures may be crucial (the same result is obtained also by Wheeler Mody (1992), Kumar (1994), Loree and Guisinger (1995)). In connection with this, the 2012 UNCTAD report recognizes that the natural resources and agricultural potential are the main drivers of "resource-seeking FDIs", and therefore contribute to incentivize foreign direct investments. The same report then identifies the availability of cheap labour force as a factor that "captures efficiency-seeking FDIs."

With particular reference to labour costs, some of the works analyzed in the review of the existing literature on FDI show conflicting results. Wheeler and Mody (1992) identify a positive relationship between labour costs and inward FDIs, while Schneider and Frey (1985) detect a negative relationship. Finally, Tsai (1994), Loree and Guisinger (1995) and Lipsey (1999) conclude that there is no relationship between the two variables.

Regarding the choice of the determinants that explain the level of inward FDIs, Drabek and Payne (1999) observe that those countries where there is greater perception of a high level of corruption are not particularly attractive to foreign investments. To take this into account, they propose to use a transparency index, identified by the independent organization "Transparency International", which should be directly correlated to foreign direct investments inflows. A similar indicator called "control of corruption" is included in *Worldwide Governance Indicators* (WGI)[16], and reflects perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "captures" of the state by elites and private interests.

Furthermore, the existing literature highlights that inward FDIs are attracted by countries that are characterized by a high return on capital. For this reason, it was necessary to identify an indicator able to measure such characteristic both for developed and developing countries. Asiedu (2002) suggests using the inverse of per capita GDP, denoted as an index of potential development, whereas Drabek and Payne (1999) propose to use the GDP growth rate. The

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[16] The Worldwide Governance Indicators (WGI) is a research dataset summarizing the views on the quality of governance provided by a large number of enterprises, citizens and expert survey respondents in industrial and developing countries.

same authors also identify, as further FDI determinants, the interest rate and the level of inflation, both with negative sign with respect to the ability to generate inward FDIs.

Relatively to the openness to foreign markets, a theoretical framework that clearly shows the link between inward FDIs, imports and exports, is included in Aizenman and Noy (2005). Turning specifically to developing countries, these authors suppose that, at first, inward FDIs in the host country produce an increase in imports of raw materials and intermediate products, and later on an increase in exports of finished products.

Finally, Haskel et al. report the presence of a positive relationship between productivity per employee and inward FDIs (in this work the value added per employee is used as a proxy for productivity).

3   DATABASE DESCRIPTION

This paragraph describes in detail the data used for the descriptive and multivariate analyses performed in the current work, with the aim to derive a point estimate of the level of inward FDIs in each country.

The database gathers information collected from various international sources and covers, when available, a time series of eight years from 2005 to 2012 and 172 countries. As Section 4 describes in detail, this has allowed an analysis with repeated observations over several years, through an unbalanced panel data.

In the collected data, the elementary unit of analysis is represented by each country observed in a given year. The available data refer to both economic and financial aspects (such as GDP and other related variables), and also to context aspects, referred to the presence of infrastructures (e.g. paved roads, internet connections), as well as to aspects measuring the stability and reliability of a country.

Most information sources have been identified using the UNDATA website, (http://data.un.org/Default.aspx) that comprises the main international sources of information organized by topic . The following is a description of the sources used and the selected information:

- UNCTAD: through the data-warehouse UnctadStat, directly accessible on the UNCTAD website (http://unctadstat.unctad.org/ReportFolders/reportFolders.aspx), the values of inward FDI stocks at current prices were identified of in each country for the years 2005-2012;

- The World Bank: information on gross domestic product was selected from the World Bank's statistics , namely GDP values at current prices (in USD), GDP annual growth rates and its per capita values (in USD).

Information about each country's infrastructures was derived from the same source, such as the level of electricity consumption per capita, the share of paved roads in the country, the share of areas for agricultural use, the value added, as a percentage of GDP, relative to the agricultural sector and the share of maritime transport over total transports in the country. Finally, an indicator about the cost of labour in each country was derived from the same

database, defined as the ratio between the minimum wage and the value added per employee;

- International Telecommunications Union: with the aim to estimate the effect of telecommunications and investments in the same field, a proxy of the level of use of Internet in each country was identified, for a relevant number of countries and years, in the share of Internet users over the total population;
- International Labour Organization: the level of labour force, in terms of number of employees in the period from 2005 to 2012, was obtained from this database;
- Transparency International: this is an independent organization that provides an index about the perception of corruption in each country;
- WTO: information about imports and exports in the period from 2005 to 2012 was selected from this database;
- UNESCO: data about education as a percentage of gross national income (GNI) were obtained from UNESCO's statistics;
- IMF: this data source was used to select the values of the annual real interest rate;
- Worldwide Governance Indicators: this data source was used to select the indicator relative to the control of corruption .

Table 1 summarizes the variables identified in the model and the database of origin. All the economic and financial variables are expressed in USD millions.
Not all the information is available for every country and for each of the years considered in the analysis, but this is not a limit for the definition of the model. In fact, as it is described below, the choice of a mixed model with repeated observations allows the use of an unbalanced panel, so that it is not necessary to exclude from the analysis the countries that are characterized by missing data for some years.

4   METHODOLOGY

This paragraph describes in detail the methodology used to derive a point estimate of the level of inward FDIs in each country and how it is applied to the available data.
The methodology aims at deriving an indirect estimate of the level of BEPS in the inward FDI stock . Specifically, the methodology is based on mixed models with repeated observations for each country; this allows the identification of fixed effects on the structural variables valid for all countries, and the evaluation of the specificity of each country through the introduction of a random effect applied to the intercept. The random intercept could thus explain not only the part of the estimate which is not identified by the explanatory variables, but also the differences between countries due to the exploitation of preferential tax systems or to a favourable political environment for foreign investors.
Therefore, a positive intercept identifies the capability of a country to attract more FDI investments than other countries, and represents a proxy of the level inward FDI stocks of at risk of BEPS.

4.1 Mixed models

The choice of the methodology adopted in this work has been made considering the availability of longitudinal data[17] for the variables considered in the model, referring to specific countries in given years.

Longitudinal studies require repeated measures - naturally ordered - of the same features in the same subjects. In the majority of cases these measures are correlated, and therefore it is not possible to use traditional statistical methods requiring independent observations and involving an underestimation of the standard error.

A more complex methodology to analyze longitudinal data can be found in the Mixed Models, that can be used without making a dimensional reduction and without losing information about the existing correlation between data relating to the same observation.

With the Mixed Models, it is possible to separate the variability between different subjects from the variability within the subject, and the models allow to define, in a simple way, a correlation structure that can correctly represent the longitudinal form of the data. For this reason, Mixed Models can be compared to generalized models in which the variance and covariance structure of the dependent variable depends on a grouping factor. In fact, they allow the description of the behavior of a population through mean values, considering the variability between the groups and the variability within the group[18].

To make this separation, random parameters (i.e. the *random effects*) are included in addition to the classic parameters of regression (i.e. the *fixed effects*), with the aim of modelling the structure of the statistical errors considering the link between data relative to the same subject (i.e. country).

Under these considerations, the models that were chosen to estimate the FDI level are multi-level regression models[19], that belong to the category of the mixed models.

Denoting y_{it} the dependent variable and X_{it}^p the covariate matrix of p order, where *i* indexes the country and *t* is the time period, the general specification of the mixed effects model can be written as follows, according to the notation of Pinheiro and Bates:

$$y_{it} = \beta_1 X_{it}^1 + \cdots + \beta_p X_{it}^p +$$
$$+ u_1 Z_{it}^1 + \cdots + u_q q Z_{it}^q + \varepsilon_{it}$$

$$u_i \sim N(0, D) \text{ i. i. d.}$$

$$\varepsilon_i \sim N(0, R) \text{i. i. d.}$$

with D and R matrix of variance and covariance.

The first part of the equation, with the coefficients $\beta_1,\dots,\beta_p$, represents the fixed effects of the model, while the second part, with the coefficients $u_1,\dots,u_q$, refers to the random effects of

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[17] Longitudinal data are the repeated measures of the same observations in different times.

[18] P.J. Diggle, K.Y. Liang e S.L. Zeger 1994. ; C.S. Davis 2002. ; .C. Pinheiro e D.M. Bates. 2000.

[19] The analysis has been conducted using the SAS statistical software.

the model and represents the "aleatory" deviation of the predictor variable in relation to the variable itself, held constant.

Essentially, the coefficients β represents the change of the variable Y in relation to the change in each predictor variable, in terms of average influence.

Instead the u components, as well as the ε_{it} components, are extracted from a probability function.

Therefore, the previous model can be written in abbreviated form as follows:

$$Y = X\beta + Zu + \varepsilon$$

where **Y** is the vector of the observations on the independent variable.

It is interesting to note that the number of years in which each subject is observed is different, and this means that an unbalanced panel of data can be used, where we have a different number of observations n_i for each subject i.

$$Y_i = \begin{pmatrix} y_{i1} \\ \vdots \\ y_{in_i} \end{pmatrix}$$

X is a matrix of dimension (n_i x p) containing the values of the p observed covariates:

$$X_i = \begin{pmatrix} X_{i1}^{(1)} & \cdots & X_{i1}^{(p)} \\ \vdots & \ddots & \vdots \\ X_{in_i}^{(1)} & \cdots & X_{in_i}^{(p)} \end{pmatrix}$$

β is a p-dimensional vector containing the estimate of the standardized fixed coefficients:

$$\beta = \begin{pmatrix} \beta_i \\ \vdots \\ \beta_p \end{pmatrix}$$

Z is a (n_i x q) matrix that contains only the observed values of the covariates for which we could insert a random effect:

$$Z_i = \begin{pmatrix} Z_{i1}^{(1)} & \cdots & Z_{i1}^{(q)} \\ \vdots & \ddots & \vdots \\ Z_{in_i}^{(1)} & \cdots & Z_{in_i}^{(q)} \end{pmatrix}$$

u is a q-dimensional vector, with q<p, containing the estimate of the random effects:

$$u = \begin{pmatrix} u_i \\ \vdots \\ u_q \end{pmatrix}$$

ε is a n_i-dimensional vector of residuals:

$$\varepsilon = \begin{pmatrix} \varepsilon_i \\ \vdots \\ \varepsilon_{n_i} \end{pmatrix}$$

Mixed Models are also defined as Multi-level Models or Hierarchical Models, due to the hierarchical structure of the data (*nested data*), with a particular specification of these models that is the Casual Intercept Model (Snijders e Bosker, 1999) in which the intercept may take different values according to the group the units belong to.

The Multi-level Linear Models (Ghilardi and Orsini, 2002) may be written through a first-level equation:

$$Y_{ij} = \beta_{0j} + \beta_{1j}x_{ij} + \varepsilon_{ij}$$

where β_{0j}, and β_{1j} describe the relation between the Y variable and the X covariates relative to the statistical unit of first level and ε_{ij} represents the error term, distributed like a Normal with expected value 0 and variance 1. The coefficient β_{0j}, β_{1j} can be described through the second-level equations:

$$\beta_{0j} = \gamma_{00} + \gamma_{01}z_j + v_{0j}$$
$$\beta_{1j} = \gamma_{10} + \gamma_{11}z_j + v_{1j}$$

The coefficients γ_{00}, γ_{01} and γ_{10}, γ_{11} may describe the relation between the variable (z) observed in each group (first-level unit) and the coefficients β_{0j}, β_{1j} included in the first-level equation.

The error terms v_{0j} and v_{1j} are considered as distributed like a Normal with expected value zero and variances τ_0^2 e τ_1^2, mutually independent and independent from the term ε_{ij} in the first-level equation.

A particular case of the two-levels linear model is that in which only the intercepts β_{0j} can assume different values depending on the group units belong to. In this case it is assumed that the β_{1j} parameter is constant (fixed part of the model) and that the coefficient β_{0j} is variable depending on the group.

In this work a linear model with a random intercept is applied, to identify the specificities of each country.

4.2   Variables selection

The methodology described in the previous paragraph is applied in this work considering the country-like grouping factor. In fact, each country is observed over a period of years.

As already mentioned, the aim of this work is to explain the inward FDI level through structural and context variables (described in paragraph 2) that are introduced in the fixed part of the model, and that, for this reason, are valid for all countries; and find out the specificity of each country through a random intercept.

The random intercept may in fact detect tax system aspects and incentive policies targeted at inward FDIs, and could therefore be interpreted as the propensity of a country to receive FDI investments, finding out the differences between countries that are due to the exploitation of

favourable tax systems, to advantage policies for foreign investors or to other aspects not directly identified by the explanatory variables included in the fixed part of the model. Therefore, a positive value of the intercept represents a proxy of the share of inward FDI stocks at risk of BEPS.

Before describing the model and the results, it is necessary to make some clarifications on the choice of the included covariates.

The high number of variables (described in paragraph 2 and showed in Table 1) required a selection procedure to identify only the more informative determinants to describe the BEPS phenomenon. A correlation analysis highlighted the presence of variables strongly correlated with each other, therefore suitable to measure the same aspect of the phenomenon. The discrimination between these correlated variables and the next selection was initially entrusted to the evaluation of the coefficient of correlation with the dependent variable. Thus, between variables measuring the same feature, it tried to choose the most correlated with the stock of inward FDIs. Another criterion for the selection of variables, making it possible to use only the most decisive and significant[20] explanatory variables from the statistical point of view, was to use the stepwise method. Table 5 shows the variables excluded from the analysis and the main reasons for exclusion.

Moreover, as described in paragraph 4.1, it is important to delete the effect resulting from the dimension of the countries considered in the analysis. So, to make the economic-financial data comparable, the dependent variable (Inward FDI) and the economic independent variables are divided by each country's GDP (Drabek e Payne, 1999, Asiedu, 2002).

5   RESULTS

5.1   Descriptive analysis

The first step to measure the scale of the BEPS phenomenon consists in a descriptive analysis of the principal FDI determinants. In fact, the aim of this work is to estimate the level of inward FDI stock depending on the structural context in each country, and afterwards, to assess the share of inward FDI stock that is not explained by structural and context variables and that could be probably linked to the BEPS phenomenon.

Through the observation of the univariate statistics reported in Table 2, we could find substantially stable trends for each variable, except for an upward trend in the stock of inward FDI and GDP.

It is important to note the coefficient of variation[21] of inward FDI, GDP and of the variable referred to labour force, depending on the highly heterogeneous countries considered in the analysis. In fact, the first 20 countries in terms of FDI stock generate over 75% of the total

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[20] T-Test on regression parameters significance.

[21] The coefficient of variation (CV) is a standardized measure of dispersion of a probability distribution or frequency distribution. It is defined as the ratio of the standard deviation to the mean.

amount of FDIs at the worldwide level. For example, United States report nearly 4,000 billion dollars of FDI investments, Hong Kong almost 1,400 billion USD[22].

Such high values can be determined by dimensional elements of the country (as for United States) or they can realistically derive from the fact that certain countries are highly attractive for foreign direct investments.

Graphs 1 and 2 show how inward FDI stocks and GDP showed an upward trend over time. Regarding GDP it is however to be noted that the annual growth rate shows a contraction between 2008 and 2009 (Figure 3), mainly due to the global real and financial crisis in that period.

To understand what may be the determinants that most influence the stock of inward FDIs, the correlation table between all the variables available in the reference database (Table 3) was analyzed. This analysis showed a strong positive relationship (86%) between the value of inward FDIs and the GDP of each country. While inward FDIs are negatively correlated with labour costs and weakly with the interest rate.

The scatter plot 5A shows the top 15 countries with the highest values of inward FDI stock in relation to GDP. It clearly shows the presence of a dimensional aspect, as mentioned previously, putting countries such as United States and China at the upper bounds of the graph.

Consequently, Graph 5B is the scatter plot of all countries, except those with higher values for FDIs and GDP (United States, China, Hong Kong, Russia, Singapore, Belgium, Switzerland, and United Kingdom), in order to identify the relationship between inward FDI stocks and GDP also for the other countries, whose graphical representation would otherwise be too flattened toward the origin of the axes.

Relatively to the FDI to GDP ratio in the period 2010 - 2012, it is possible to see that higher values are shown by Hong Kong, Liberia, Luxembourg, Aruba, Singapore, Saint Kitts and Nevis, Antigua and Barbuda, Saint Vincent and the Grenadines and Belgium (Table 4).

5.2   Application

This section describes the estimation model and the results obtained. In particular, three versions of the model are analyzed, differing in the presence or absence of the variables that are not significant from a statistical point of view, and in the exclusion or not of countries showing large amounts of FDIs, significantly higher than the average values for the population under analysis.

All models estimate the ratio between FDI and GDP, using the variables described in section 3.2 as covariates. Table 6 shows the fixed effects of the three models. In particular, in model 1 it can be observed that the variables "real interest rate" and "value added per employee" were not statistically significant. The "real interest rate" has been excluded from subsequent models 2 and 3 because it was not statistically significant also in these models.

In all three models, it is possible to observe the presence of a positive coefficient associated with the potential development index, confirming the finding by Edwards (1990) and Jaspensen et al. (2000) about the existence of an inverse relationship between GDP per capita and FDIs. This also explains the presence of a negative coefficient associated to the growth rate of GDP.

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[22] Values relative to 2012.

In fact, countries with a robust industrial structure and great financial strength, which can certainly be considered key factors for internal development, tend not to resort to policies that can accelerate and attract foreign investments.

With regard to the relationship between direct investments and foreign trade, a positive relationship between FDI and imports is observed. This phenomenon may be related to a significant share of direct investments aimed at processing raw materials or semi-finished products of which the country receiving the investment is not provided, as discussed in section 1.1.

The GDP deflator has a negative impact on the trend of the FDI stock in all models. On the contrary, when countries with high productivity (measured by the value added per employee) are analyzed, an increase in the level of inward FDIs is observed.

In all the models we can observe a positive direct effect between perceptions of Control of Corruption Index and Inward FDIs.

In order to perform a sensitivity analysis on the presence of countries with a high level of inward FDIs, such as China, United States, Hong Kong, Japan and Russia, it was considered appropriate to define model 3 without these countries. The comparison between models 2 and 3 does not show big differences, both in terms of estimated coefficients and from a comparison between the diagnostic graphics.

Under these considerations, model 2, based on all countries considered in the analysis, was chosen to estimate the level of inward FDI stock at risk of BEPS.

Table 7 shows the random effects of the model, that are applied only on the intercept. The use of a random intercept allows to refine the estimate. In particular, the model can in this way identify the specificity of each country and economically qualify it.

In this work, the focus was on countries with positive values of the intercept, identifying a higher level of inward FDI stock than the amount which is estimated through the structural variables in the regression function.

For any of those countries, in particular the ones associated with extremely high values of the intercept, there is a possible positive effect on FDIs due to favorable taxation regimes or policies.

The random intercept was used to identify the value of the FDI to GDP ratio for each country and this value, multiplied by the GDP, represents the absolute value of inward FDIs at risk of BEPS. On aggregate, the result of this operation leads to an estimate of 1,900 billion USD of inward FDI stocks that are potentially driven by BEPS phenomena, with a high concentration in a small group of countries.

Through a direct comparison between the random intercepts of the model and the list of so-called "tax havens" or "offshore financial centres", as identified by the economic literature[23] it can be found that among the countries identified by the first 13 intercepts there are 12 tax havens (Table 8, column OECD) or offshore financial centres (Table 8, column FSF-IMF): Liberia, Hong Kong, Luxemburg, Saint Vincent and the Grenadines, Saint Lucia, Singapore, Bahamas, Lebanon, Belgium, Solomon Islands, Malta and Sao Tome and Principe. The result of this comparison corroborates the hypothesis of this work, that inward FDIs that are not explained by other determinants are mainly associated with BEPS behaviors.

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[23] Booijink L. and Weyzig F. (2007), based on OECD (2006) and Financial Stability Forum (2000).

In addition to this, these high positive intercepts can be also compared with Table 4, that reports the values of the FDI to GDP ratio. Countries with a high FDI to GDP ratio also show high positive intercepts, and many of them are tax havens or offshore financial centres. This means that extremely high levels of inward FDI/GDP are often associated with an "unexplained" share of FDIs, potentially associated with BEPS phenomena. This result can be interpreted as corroborating the OECD choice to include an indicator (n.1) on the concentration of foreign direct investment to GDP in the list of 6 indicators to assess and monitor BEPS in the *Public Discussion Draft* on BEPS Action 11[24].

6   CONCLUSIONS

This paper is intended to provide a useful contribution to the activities related to the estimation of the scale of tax avoidance phenomena within the OECD-G20 project on "Addressing Base Erosion and Profit Shifting" (BEPS), on the basis of inward FDI stocks for a set of 172 countries and through the analysis of the economic and structural FDI determinants.

The analysis performed highlights the existence of significant BEPS phenomena, as in the countries considered nearly 1,900 billion USD of inward FDI stocks are potentially driven by BEPS phenomena, with a high concentration in a small group of countries, corresponding mainly with the countries considered as tax havens by the economic literature.

In addition the analysis shows that extremely high levels of inward FDI/GDP are often associated with an "unexplained" share of FDIs, potentially associated with BEPS phenomena.

The current work is indeed based only on data related to inward FDI stocks, while in some cases BEPS phenomena can have an impact also on outward FDIs; a desirable extension of the analysis would therefore consider outward FDIs to analyze the BEPS phenomenon as a whole, with due caution to avoid the double counting of potential BEPS phenomena. A further refinement of the analysis will be possible using Special Purpose Entities FDI data, as soon as a higher number of countries will report that data separately from total FDI data.

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[24] OECD (2015), page 32.

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TABLES AND GRAPHS

Table 1   Variables and sources

VARIABLE	SOURCE
Inward FDI (Million US Dollars)	UNCTAD
GDP at current prices (Million US Dollars)	The World Bank
GDP Growth (Annual %)	The World Bank
GDP Per Capita, Atlas Method (US Dollars)	The World Bank
Percentage of individuals using Internet (%)	International Telecommunications Union
Agricultural land (% of land area)	The World Bank
Agriculture, value added (% of GDP)	The World Bank
Electric power consumption (kWh per capita)	The World Bank
Roads, paved (% of total roads)	The World Bank
Labor Force (Total Number)	International Labor Organization
Labor Cost: ratio of the minimum wage to the average value added per worker	Doing Business - World Bank Group
Liner shipping connectivity index (%)	The World Bank
Corruption perception index	Transparency international
Real interest rate (%)	International Monetary Fund
Value added per worker	The World Bank
Exports (Million US Dollars)	WTO
Imports (Million US Dollars)	WTO
Inflation, GDP deflator (annual %)	The World Bank
Control of Corruption Index	The Worldwide Governance Indicators - World Bank Group
Public expenditure on education as % of GNI	UNESCO Institute for Statistics

Table 2   Descriptive Statistics

		2005	2006	2007	2008	2009	2010	2011	2012
Inward FDI (Million US Dollars)	Number	199	199	199	200	200	200	201	200
	Average	58.662,66	72.388,77	90.643,54	77.931,34	91.557,78	101.901,42	103.848,34	113.911,65
	Median	3.319,20	3.898,66	5.555,00	6.404,08	7.623,97	8.756,87	9.461,00	11.050,84
	Coefficient of variation %	393,13	380,96	345,96	301,55	301,81	302,34	303,16	308,10
Labor Force (Total Number)	Number	179	179	179	179	179	179	179	179
	Average	16.782.886,95	16.991.251,55	17.191.365,67	17.389.604,83	17.570.194,98	17.742.018,46	18.015.447,54	18.280.203,70
	Median	3.431.566,00	3.509.773,00	3.655.886,00	3.677.356,00	3.785.650,00	3.917.024,00	4.044.796,00	4.174.221,00
	Coefficient of variation %	405,74	403,15	400,43	397,27	394,49	390,97	389,99	388,12
Liner shipping connectivity index (%)	Number	149	149	148	149	149	149	150	150
	Average	18,20	18,67	19,92	20,65	21,47	22,68	23,28	24,93
	Median	10,16	9,12	10,61	11,05	11,31	12,49	12,01	14,01
	Coefficient of variation %	120,98	120,79	117,95	116,98	114,97	114,24	114,82	110,38
GDP at current prices (Million US Dollars)	Number	184	184	184	182	182	181	181	179
	Average	248.733,08	269.430,31	303.576,94	336.523,87	318.709,90	350.667,96	388.529,35	400.917,67
	Median	14.886,10	17.252,15	20.430,01	23.744,19	22.990,05	23.132,45	28.480,34	30.362,32
	Coefficient of variation %	436,55	424,73	400,32	378,58	392,44	378,30	365,96	372,27
GDP Per Capita, Atlas Method (US Dollars)	Number	193	193	193	194	194	194	194	194
	Average	10.406,89	11.319,82	12.872,98	13.986,76	12.375,50	13.078,92	14.432,77	14.384,60
	Median	3.125,81	3.433,13	4.075,92	4.675,69	4.444,31	4.944,77	5.470,36	5.699,80
	Coefficient of variation %	150,42	148,92	147,41	143,85	142,18	140,51	141,54	140,76
GDP Growth (Annual %)	Number	183	183	184	182	182	180	180	180
	Average	5,22	6,01	6,04	4,05	0,07	4,31	4,16	3,41
	Median	4,71	5,54	5,91	3,89	0,42	4,04	3,91	3,41
	Coefficient of variation %	74,43	76,22	71,69	106,74	7.813,47	99,95	94,77	109,38
Electric power consumption (kWh per capita)	Number	133	134	134	133	132	132	132	n.a.
	Average	3.989,20	4.044,82	4.131,34	4.252,54	4.156,74	4.325,61	4.323,33	n.a.
	Median	2.068,00	2.173,72	2.275,99	2.404,57	2.378,87	2.524,52	2.643,94	n.a.
	Coefficient of variation %	122,80	124,01	127,35	138,55	140,30	138,54	137,58	n.a.
Agricultural land (% of land area)	Number	185	187	187	187	187	187	187	n.a.
	Average	39,18	39,41	39,16	39,40	39,43	39,52	39,43	n.a.
	Median	39,31	39,29	39,07	39,36	40,08	40,25	40,13	n.a.
	Coefficient of variation %	56,49	56,21	56,45	56,59	56,45	56,46	56,40	n.a.
Percentage of individuals using Internet (%)	Number	184	183	189	188	187	188	189	188
	Average	19,79	22,38	24,44	27,27	29,98	33,54	36,86	40,12
	Median	9,20	12,31	15,04	18,50	24,05	29,47	34,95	40,25
	Coefficient of variation %	115,53	107,48	102,60	96,03	89,96	82,19	77,12	72,88

Table 3   Descriptive Statistics

		2005	2006	2007	2008	2009	2010	2011	2012
Roads, paved (% of total roads)	Number	75	72	74	76	78	76	65	n.a.
	Average	58,10	57,54	55,16	59,15	58,38	62,03	62,44	n.a.
	Median	63,93	62,82	54,87	64,42	60,88	65,79	65,85	n.a.
	Coefficient of variation %	55,81	56,23	57,88	53,18	54,71	49,48	48,74	n.a.
Real interest rate (%)	Number	146	145	145	136	134	130	125	123
	Average	6,57	8,25	9,02	2,99	11,38	5,12	3,91	6,52
	Median	5,51	4,43	4,05	3,10	8,55	5,30	4,02	5,58
	Coefficient of variation %	301,34	515,67	528,48	274,84	101,68	167,49	217,59	121,74
Inflation, GDP deflator (annual %)	Number	183	183	184	182	182	180	180	180
	Average	8,07	8,16	7,26	10,29	1,92	7,05	7,87	5,17
	Median	5,63	6,08	5,76	8,34	2,35	4,64	5,73	3,29
	Coefficient of variation %	95,06	113,49	76,38	83,76	504,58	142,39	101,06	148,01
Corruption perception index	Number	172	172	172	172	172	172	172	172
	Average	43,22	43,22	43,22	43,22	43,22	43,22	43,22	43,22
	Median	37,00	37,00	37,00	37,00	37,00	37,00	37,00	37,00
	Coefficient of variation %	45,87	45,87	45,87	45,87	45,87	45,87	45,87	45,87
Public expenditure on education as % of GNI	Number	106	107	107	122	114	112	79	34
	Average	4,73	4,62	4,59	4,75	5,17	5,02	4,55	4,04
	Median	4,57	4,65	4,77	4,85	5,17	5,02	4,56	3,48
	Coefficient of variation %	38,45	33,26	32,65	33,81	35,11	34,62	37,24	40,43
Exports (Million US Dollars)	Number	193	193	193	193	192	192	193	193
	Average	51.986,05	60.103,79	69.624,02	80.532,48	62.662,47	76.198,63	91.027,37	91.300,67
	Median	4.302,00	4.539,00	5.206,00	6.407,00	5.218,00	6.739,00	8.358,00	7.931,00
	Coefficient of variation %	264,27	263,21	264,99	258,25	264,24	264,92	260,74	265,23
Imports (Million US Dollars)	Number	192	192	192	192	192	192	192	192
	Average	55.125,03	63.254,77	72.922,92	84.363,58	65.062,75	78.871,04	94.288,70	94.912,67
	Median	4.626,86	5.459,88	6.511,45	8.749,30	6.947,64	8.145,10	9.268,00	9.959,54
	Coefficient of variation %	302,18	297,11	283,36	272,06	271,96	276,76	274,67	276,48
Value added per worker	Number	178	178	178	178	178	178	178	178
	Average	0,02	0,02	0,02	0,03	0,02	0,02	0,03	0,03
	Median	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01
	Coefficient of variation %	142,64	140,89	139,86	135,84	132,99	131,48	132,82	130,70
Control of Corruption Index	Numero	188	188	188	188	189	189	189	188
	Media	-0,03	-0,02	-0,01	-0,02	-0,03	-0,03	-0,02	-0,03
	Mediana	-0,33	-0,29	-0,33	-0,30	-0,31	-0,32	-0,30	-0,33
	Coeffciente di variazione %	-3.998,00	-6.234,56	-6.957,76	-6.406,16	-3.914,14	-4.053,22	-4.743,79	-3.704,77

Table 3 Correlation Matrix

	Inward FDI (Million US Dollars)	Labor Force (Total Number)	Liner shipping connectivity index (%)	GDP at current prices (Million US Dollars)	GDP Per Capita, Atlas Method (US Dollars)	GDP Growth (Annual %)	Electric power consumption (kWh per capita)	Agricultural land (% of land area)
Inward FDI (Million US Dollars)	1.00000 <.0001 1598	0.25078 <.0001 1425	0.60492 <.0001 1192	0.86014 <.0001 1450	0.37655 <.0001 1540	-0.11475 <.0001 1447	0.26063 <.0001 924	0.06162 0.0261 1303
Labor Force (Total Number)	0.25078 <.0001 1425	1.00000 1432	0.44225 <.0001 1084	0.44248 <.0001 1378	-0.03926 0.1391 1421	0.10617 <.0001 1377	-0.05834 0.0754 930	0.08585 0.0026 1230
Liner shipping connectivity index (%)	0.60492 <.0001 1192	0.44225 <.0001 1084	1.00000 1193	0.52882 <.0001 1117	0.30118 <.0001 1161	-0.02264 0.4503 1114	0.13235 0.0003 737	0.11309 0.0003 1011
GDP at current prices (Million US Dollars)	0.86014 <.0001 1450	0.44248 <.0001 1378	0.52882 <.0001 1117	1.00000 1457	0.26307 <.0001 1454	-0.07304 0.0053 1453	0.20093 <.0001 910	0.03297 0.2419 1262
GDP Per Capita, Atlas Method (US Dollars)	0.37655 <.0001 1540	-0.03926 0.1391 1421	0.30118 <.0001 1161	0.26307 <.0001 1454	1.00000 1549	-0.17948 <.0001 1451	0.75993 <.0001 927	-0.23768 <.0001 1304
GDP Growth (Annual %)	-0.11475 <.0001 1447	0.10617 <.0001 1377	-0.02264 0.4503 1114	-0.07304 0.0053 1453	-0.17948 <.0001 1451	1.00000 1454	-0.16709 <.0001 908	0.03067 0.2770 1258
Electric power consumption (kWh per capita)	0.26063 <.0001 924	-0.05834 0.0754 930	0.13235 0.0003 737	0.20093 <.0001 910	0.75993 <.0001 927	-0.16709 <.0001 908	1.00000 930	-0.32156 <.0001 921
Agricultural land (% of land area)	0.06162 0.0261 1303	0.08585 0.0026 1230	0.11309 0.0003 1011	0.03297 0.2419 1262	-0.23768 <.0001 1304	0.03067 0.2770 1258	-0.32156 <.0001 921	1.00000 1307
Percentage of individuals using Internet (%)	0.39645 <.0001 1489	-0.01785 0.5021 1417	0.43842 <.0001 1152	0.27821 <.0001 1435	0.78403 <.0001 1486	-0.30296 <.0001 1432	0.69821 <.0001 922	-0.20121 <.0001 1285
Roads, paved (% of total roads)	0.21647 <.0001 513	-0.03751 0.4003 505	0.29433 <.0001 389	0.07434 0.0955 504	0.43983 <.0001 516	-0.10704 0.0163 503	0.18138 <.0001 456	0.05299 0.2364 501
Real interest rate (%)	-0.03389 0.2660 1079	-0.02366 0.4462 1039	-0.13530 <.0001 840	-0.03106 0.3087 1076	-0.09866 0.0011 1084	-0.12177 <.0001 1077	-0.06257 0.1033 679	0.04089 0.2089 946
Inflation, GDP deflator (annual %)	-0.13442 <.0001 1447	-0.00666 0.8048 1377	-0.14644 <.0001 1114	-0.09817 0.0002 1453	-0.19563 <.0001 1451	0.22832 <.0001 1454	-0.16269 <.0001 908	0.08718 0.0020 1258
Corruption perception index	0.38235 <.0001 1369	-0.02930 0.2816 1352	0.39460 <.0001 1036	0.24262 <.0001 1331	0.75621 <.0001 1365	-0.23563 <.0001 1329	0.66280 <.0001 930	-0.21183 <.0001 1188
Public expenditure on education as % of GNI	0.06383 0.0748 780	-0.12200 0.0007 763	-0.03510 0.4000 577	0.02146 0.5529 767	0.22809 <.0001 779	-0.26594 <.0001 764	0.37745 <.0001 558	0.06100 0.1001 728
Exports (Million US Dollars)	0.69693 <.0001 1527	0.56790 <.0001 1422	0.74213 <.0001 1164	0.80222 <.0001 1455	0.33456 <.0001 1515	-0.06399 0.0147 1452	0.23728 <.0001 928	0.04190 0.1324 1291
Imports (Million US Dollars)	0.87043 <.0001 1529	0.51118 <.0001 1424	0.74550 <.0001 1166	0.92165 <.0001 1457	0.33907 <.0001 1515	-0.08391 0.0014 1454	0.23526 <.0001 930	0.05551 0.0460 1293
Value added per worker	0.43019 <.0001 1417	-0.04075 0.1243 1424	0.39477 <.0001 1076	0.30879 <.0001 1370	0.98450 <.0001 1413	-0.20007 <.0001 1369	0.73029 <.0001 923	-0.20010 <.0001 1223
Control of Corruption Index	-0.04619 0.0849 1392	0.34630 <.0001 1145	0.21855 <.0001 1430	0.21855 <.0001 1430	0.75199 <.0001 1496	-0.23763 <.0001 1427	0.67419 <.0001 916	-0.23016 <.0001 1276

Table 3   Correlation Matrix

	Percentage of individuals using Internet (%)	Roads, paved (% of total roads)	Real interest rate (%)	Inflation, GDP deflator (annual %)	Corruption perception index	Public expenditure on education as % of GNI	Exports (Million US Dollars)	Imports (Million US Dollars)	Value added per worker	Control of Corruption Index
Inward FDI (Million US Dollars)	0.39645	0.21647	-0.03389	-0.13442	0.38235	0.06383	0.69693	0.87043	0.43019	0.35532
	<.0001	<.0001	0.2660	<.0001	<.0001	0.0748	<.0001	<.0001	<.0001	<.0001
	1489	513	1079	1447	1369	780	1527	1529	1417	1498
Labor Force (Total Number)	-0.01785	-0.03751	-0.02366	-0.00666	-0.02930	-0.12200	0.56790	0.51118	-0.04075	-0.04619
	0.5021	0.4003	0.4462	0.8048	0.2816	0.0007	<.0001	<.0001	0.1243	0.0849
	1417	505	1039	1377	1352	763	1422	1424	1424	1392
Liner shipping connectivity index (%)	0.43842	0.29433	-0.13530	-0.14644	0.39460	-0.03510	0.74213	0.74550	0.39477	0.34630
	<.0001	<.0001	<.0001	<.0001	<.0001	0.4000	<.0001	<.0001	<.0001	<.0001
	1152	389	840	1114	1036	577	1164	1166	1076	1145
GDP at current prices (Million US Dollars)	0.27821	0.07434	-0.03106	-0.09817	0.24262	0.02146	0.80222	0.92165	0.30879	0.21855
	<.0001	0.0955	0.3087	0.0002	<.0001	0.5529	<.0001	<.0001	<.0001	<.0001
	1435	504	1076	1453	1331	767	1455	1457	1370	1430
GDP Per Capita, Atlas Method (US Dollars)	0.78403	0.43983	-0.09866	-0.19563	0.75621	0.22809	0.33456	0.33907	0.98450	0.21855
	<.0001	<.0001	0.0011	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001
	1486	516	1084	1451	1365	779	1515	1515	1413	1430
GDP Growth (Annual %)	-0.30296	-0.10704	-0.12177	0.22832	-0.23563	-0.26594	-0.06399	-0.08391	-0.20007	0.75199
	<.0001	0.0163	<.0001	<.0001	<.0001	<.0001	0.0147	0.0014	<.0001	<.0001
	1432	503	1077	1454	1329	764	1452	1454	1369	1496
Electric power consumption (kWh per capita)	0.69821	0.18138	-0.06257	-0.16269	0.66280	0.37745	0.23728	0.23526	0.73029	-0.23763
	<.0001	<.0001	0.1033	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001
	922	456	679	908	930	558	928	930	923	1427
Agricultural land (% of land area)	-0.20121	0.05299	0.04089	0.08718	-0.21183	0.06100	0.04190	0.05551	-0.20010	0.67419
	<.0001	0.2364	0.2089	0.0020	<.0001	0.1001	0.1324	0.0460	<.0001	<.0001
	1285	501	946	1258	1188	728	1291	1293	1223	916
Percentage of individuals using Internet (%)	1.00000	0.46419	-0.08680	-0.27932	0.80021	0.29281	0.38617	0.38968	0.77951	-0.23016
		<.0001	0.0044	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001
	1496	514	1074	1432	1352	769	1479	1481	1409	1276
Roads, paved (% of total roads)	0.46419	1.00000	-0.31212	-0.07202	0.37767	0.07989	0.15333	0.18595	0.46513	0.79521
	<.0001		<.0001	0.1067	<.0001	0.1314	0.0005	<.0001	<.0001	<.0001
	514	516	390	503	507	358	513	515	504	1456
Real interest rate (%)	-0.08680	-0.31212	1.00000	-0.23956	-0.09589	-0.09684	-0.05867	-0.05050	-0.10843	0.38389
	0.0044	<.0001		<.0001	0.0025	0.0186	0.0537	0.0965	0.0005	<.0001
	1074	390	1084	1077	993	590	1082	1084	1039	516
Inflation, GDP deflator (annual %)	-0.27932	-0.07202	-0.23956	1.00000	-0.32576	-0.04494	-0.11745	-0.13864	-0.20553	-0.09370
	<.0001	0.1067	<.0001		<.0001	0.2147	<.0001	<.0001	<.0001	0.0022
	1432	503	1077	1454	1329	764	1452	1454	1369	1061
Corruption perception index	0.80021	0.37767	-0.09589	-0.32576	1.00000	0.38306	0.33147	0.35117	0.73342	-0.31699
	<.0001	<.0001	0.0025	<.0001		<.0001	<.0001	<.0001	<.0001	<.0001
	1352	507	993	1329	1376	736	1358	1360	1344	1427
Public expenditure on education as % of GNI	0.29281	0.07989	-0.09684	-0.04494	0.38306	1.00000	0.04540	0.03380	0.24594	0.97837
	<.0001	0.1314	0.0186	0.2147	<.0001		0.2059	0.3458	<.0001	<.0001
	769	358	590	764	736	781	778	780	759	1352
Exports (Million US Dollars)	0.38617	0.15333	-0.05867	-0.11745	0.33147	0.04540	1.00000	0.93384	0.37624	0.34959
	<.0001	0.0005	0.0537	<.0001	<.0001	0.2059		<.0001	<.0001	<.0001
	1479	513	1082	1452	1358	778	1542	1534	1414	769
Imports (Million US Dollars)	0.38968	0.18595	-0.05050	-0.13864	0.35117	0.03380	0.93384	1.00000	0.38377	0.29435
	<.0001	<.0001	0.0965	<.0001	<.0001	0.3458	<.0001		<.0001	<.0001
	1481	515	1084	1454	1360	780	1534	1536	1416	1473
Value added per worker	0.77951	0.46513	-0.10843	-0.20553	0.73342	0.24594	0.37624	0.38377	1.00000	0.31996
	<.0001	<.0001	0.0005	<.0001	<.0001	<.0001	<.0001	<.0001		<.0001
	1409	504	1039	1369	1344	759	1414	1416	1424	1473
Control of Corruption Index	0.79521	0.38389	-0.09370	-0.31699	0.97837	0.34959	0.29435	0.31996	0.75531	0.75531
	<.0001	<.0001	0.0022	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001
	1456	516	1061	1427	1352	769	1473	1473	1384	1384

Table 4   FDI Variation Rate and FDI/GDP Ratio (period 2010-2012)

Country	FDI Variation Rate 2010-2012 (%)	FDI/GDP Ratio 2010-2012 (%)
Hong Kong	22,34	508,93
Liberia	45,68	386,51
Luxembourg	-22,33	275,79
Aruba	-8,13	254,88
Singapore	14,96	245,75
Saint Kitts and Nevis	13,3	238,92
Antigua and Barbuda	6	216,03
Saint Vincent and the Grenadines	16,08	204,34
Belgium	6,1	201,51
Bahamas	19,55	186,01
Saint Lucia	10,6	184,26
Malta	-2,58	183,04
Grenada	6,12	166,56
Seychelles	16,1	164,07
Belize	21,75	155,15
Solomon Islands	34,43	150,64
Congo	38,25	135,78
Dominica	5,56	130,75
Ireland	4,38	129,3
Sao Tome and Principe	32,52	126,14
Lebanon	15,94	122,83
Mongolia	165,73	109,23
Switzerland	7,75	104,84
Montenegro	15,37	103,05

Table 5   Variables excluded

VARIABLE	REASON FOR EXCLUSION
Agricultural land (% of land area)	*Not selected by stepwise*
Agriculture, value added (% of GDP)	*Not selected by stepwise*
Electric power consumption (kWh per capita)	*Not selected by stepwise*
Roads, paved (% of total roads)	*Not selected by stepwise*
Labor Force (Total Number)	*Not selected by stepwise*
Corruption perception index	*Not selected by stepwise*
Labor Cost: ratio of the minimum wage to the average value added per worker	*Insignificant*
Liner shipping connectivity index (%)	*Not selected by stepwise*
Exports (Million US Dollars)	*Insignificant or with the opposite sign with respect to economic theory*
Public expenditure on education as % of GNI	*Insignificant*

Table 6   Fixed effects in Models 1, 2 and 3

Variabile risposta FDI/GDP			
Variabile	Mod.1	Mod.2	Mod.3
		(tutti i Paesi)	(Esclusi "grandi")
GDP Growth (Annual %)	-0.236**	-0,330***	-0,240***
Real interest rate (%)	-0,092		
Import/GDP	0,347***	0,572***	0,333***
Log(Percentage of individuals using Internet (%) - connectivity index)	6,482***	5,430***	6,315***
Control of Corruption Index	5,882***	6,002***	5,964***
Potential development index	3,268***	1,641***	2,820***
Inflation, GDP deflator (annual %)	-0,264**	-0,212***	-0,216***
Value added per worker	74,968	253,790***	215,810***

Table 7   Random Effects for Models 1, 2 and 3

Country	Mod.1	Mod.2 (All countries)	Mod.3 (Without "Big Contries")
Dependet variable FDI/GDP			
Liberia	372.4000	372.7400	376.4400
Hong Kong		299.5900	
Luxembourg	164.4800	125.4100	139.0200
Saint Vincent and the Grenadines	100.8200	99.0990	102.0300
Saint Lucia	97.4460	94.3597	98.6575
Congo	54.5594	86.7245	85.5063
Singapore		86.7058	116.2100
Bahamas	86.2382	80.7494	82.9662
Lebanon	73.5616	70.1893	73.4526
Belgium		64.0478	80.2757
Solomon Islands	53.6077	53.5770	56.1858
Malta	60.2033	49.2122	57.6328
Sao Tome and Principe	45.7467	45.5788	47.6180
Montenegro	40.9053	36.3746	41.9078
Gambia	26.4157	30.0917	28.1675
Belize	32.8458	29.5628	33.9211
Equatorial Guinea	33.9782	29.0485	32.2342
Mauritania	29.8981	28.3674	31.9347
Zambia	23.3850	27.6005	25.6752
Brunei Darussalam	34.6289	27.2273	26.8787
Mongolia	28.1123	26.1196	30.2631
Turkmenistan		25.5319	24.6685
Jamaica	26.5412	25.0521	27.6049
Trinidad and Tobago	27.6091	23.9777	25.2934
Jordan	27.8333	22.1644	29.6016
Panama	26.3959	21.6324	27.7354
Ireland	36.2407	21.5846	25.2193
Bulgaria	25.4297	21.2555	27.0472
Chad	22.7880	21.0307	16.7455
Kazakhstan		19.7921	17.9520
Guyana	22.8180	19.5070	25.0779
Guinea		16.7823	15.2409
Mozambique	12.9678	16.0765	15.8707
Vanuatu	11.4610	14.9637	16.3439
Sierra Leone	10.1199	14.9022	12.0830
Sudan		14.1521	7.9809
Cyprus	18.5775	13.5407	15.8287
Tunisia		12.2381	14.4911
Georgia	10.5577	11.4041	12.5944
Chile	10.0803	10.6082	9.2528
Cambodia		9.7916	16.1511
Fiji	11.6640	9.1439	13.7457
Central African Republic	1.8205	8.0644	1.8915
Nicaragua	6.8644	7.6564	9.6899
Djibouti	6.7365	7.6515	9.9529
Serbia	8.3173	7.2238	9.2992
Eritrea		6.7788	6.2371
Tanzania, United Republic of	1.5661	6.6668	4.5201
Madagascar	3.3054	5.4648	3.8983
Azerbaijan	-2.0090	4.3245	-1.2867
Bolivia, Plurinational State of	-2.4793	3.4510	0.0501
Cabo Verde	2.3437	3.0650	4.2690
Niger		2.9278	1.0935
Lao People's Democratic Republic	-0.1087	2.8940	-0.5432
Papua New Guinea	0.1632	2.1226	2.7958
Uganda	-4.8915	1.9828	-2.3229
Ethiopia	-1.5710	0.7768	-1.7632

Table 7 Random Effects for Models 1, 2 and 3

Dependet variable FDI/GDP			
Country	Mod.1	Mod.2 (All countries)	Mod.3 (Without "Big Contries")
Switzerland		-0.5917	4.1726
Estonia	8.2612	-0.9474	7.8356
Nigeria	-10.1922	-1.6973	-8.1092
Egypt	-8.1216	-2.0390	-6.0006
Croatia	0.6312	-2.2327	-0.5726
Armenia	-4.2674	-2.5177	-2.8295
Russian Federation		-2.8057	
Morocco	-10.7751	-3.9407	-4.4203
Colombia	-11.1410	-5.0479	-10.4450
Cameroon	-8.3025	-5.3927	-9.3962
Angola	-9.2308	-5.4494	-8.6516
Dominican Republic	-8.2463	-5.5785	-7.5314
Bahrain	1.3134	-6.5283	-1.4540
Argentina	-11.8862	-6.5568	-11.5530
Macao	-1.3403	-6.6448	-6.4132
South Africa	-7.9472	-6.7669	-7.6423
Indonesia	-13.3405	-7.3141	-11.3911
Ukraine	-8.1195	-7.5346	-5.9789
Iceland	3.5672	-7.8893	-4.8882
Mali		-7.9266	-9.5400
Hungary	1.0848	-8.1428	0.4453
Brazil	-11.9386	-8.4067	-14.6836
Venezuela, Bolivarian Republic of	-12.2813	-8.7693	-13.0185
Namibia	-7.1346	-9.0969	-5.9586
Peru	-14.8436	-9.3752	-14.4672
Ghana		-9.7229	-10.7331
Malawi	-11.5938	-10.2414	-9.3113
Libya	-11.6748	-11.1895	-14.2562
Maldives	-5.7277	-11.5529	-4.5961
El Salvador		-12.6843	-11.4892
Gabon	-17.6144	-12.8325	-14.6255
Afghanistan	-19.4411	-13.3546	-16.3734
Honduras	-10.0522	-13.4881	-7.8871
Pakistan	-22.1927	-14.3356	-19.3938
Uzbekistan		-15.0238	-19.6579
Iraq	-15.2936	-15.1735	-15.2036
Czech Republic	-6.1001	-15.4596	-7.7267
Portugal	-11.3941	-15.5497	-13.9666
Sweden	-17.3526	-15.6602	-12.6418
Bangladesh	-21.7588	-15.7299	-19.0245
Ecuador	-9.1669	-15.7883	-18.1095
Mexico	-16.6949	-15.8669	-16.8835
India	-23.6410	-16.1822	-21.0868
Poland	-18.0935	-16.7477	-16.0867
Barbados	-14.2210	-16.7915	-15.2691
Burundi	-24.1754	-17.0847	-20.8360
Benin		-17.7830	-20.2475
Thailand	-14.8727	-18.1087	-12.5623
Burkina Faso		-18.1238	-21.9633
Guinea-Bissau		-18.3023	-22.5496
Viet Nam	-16.1660	-18.4854	-12.4385
Yemen	-21.7762	-18.5782	-19.9723
Iran, Islamic Republic of	-23.2907	-18.6002	-23.1639
Albania	-20.8151	-18.7047	-19.3650
Macedonia, the former Yugoslav Republic of	-16.2229	-18.9846	-14.1158
Costa Rica	-17.8729	-19.3543	-17.6339
Samoa	-16.0904	-19.4664	-14.8924
New Zealand	-15.2425	-20.5042	-20.9527

Table 7 - Random Effects for Models 1, 2 and 3

| Dependet variable FDI/GDP			
Country	Mod.1	Mod.2 (All countries)	Mod.3 (Without "Big Contries")
Spain	-14.8238	-20.6746	-20.3992
Uruguay	-23.4817	-20.7761	-23.6310
Moldova, Republic of	-17.1554	-21.0403	-14.2516
Togo		-21.3831	-19.6142
Kyrgyzstan	-19.0621	-21.5411	-16.2736
Slovakia	-12.1435	-21.7350	-12.7761
Algeria	-25.5375	-21.8236	-24.6047
Netherlands	-3.2916	-22.0912	-11.3431
Tajikistan	-23.1741	-22.6034	-20.1895
Saudi Arabia		-22.7237	-24.1493
Tonga	-22.5271	-22.7351	-20.7725
Guatemala	-25.0741	-23.0130	-23.4059
Sri Lanka	-27.0074	-23.2631	-24.8967
Latvia	-19.2441	-23.4048	-19.3096
China		-23.8691	
Syrian Arab Republic	-27.2278	-23.8696	-24.7841
Philippines	-28.2013	-24.0490	-25.6419
Comoros	-27.8581	-24.0624	-25.0159
Rwanda	-29.7192	-24.4003	-29.1691
United Kingdom		-24.4279	-23.5642
Turkey		-24.8784	-26.5201
Swaziland	-22.6349	-25.3877	-20.3991
Bosnia and Herzegovina	-23.6244	-26.1532	-21.5674
Nepal	-30.5323	-26.2597	-29.2342
Haiti	-31.2399	-26.6075	-28.5445
Paraguay	-27.9961	-28.1194	-26.8293
France	-18.0890	-28.1199	-26.9608
Kenya	-34.9662	-29.6037	-31.9951
Oman	-24.2892	-30.6220	-28.4837
Australia	-20.3704	-31.7520	-31.4845
Senegal		-33.4029	-34.0485
Israel	-27.8087	-34.7114	-33.4859
Denmark		-34.9347	-31.8809
Lithuania	-26.6806	-35.2600	-28.1288
Malaysia	-28.5613	-35.2899	-27.6821
Mauritius	-34.6521	-37.2978	-34.2248
Botswana	-36.2997	-38.1907	-35.6722
Belarus	-34.0282	-38.5008	-32.0679
Greece	-33.8481	-38.8760	-38.6939
Canada	-29.3449	-39.5576	-37.8820
Italy	-33.5846	-43.0432	-41.9950
Austria	-29.3695	-43.9057	-38.2816
United States		-44.3495	
Finland	-33.5762	-44.9007	-42.2514
Qatar	-30.7625	-45.1109	-43.4240
Bhutan	-49.5955	-48.8496	-47.2221
Korea, Republic of	-44.9293	-49.2780	-47.3302
Lesotho	-38.2319	-49.9475	-34.5750
Slovenia	-39.3822	-50.5303	-42.0514
Kuwait	-40.8340	-52.2111	-51.8514
Norway	-33.1227	-52.2394	-49.3452
Germany	-43.6795	-53.7777	-51.3803
United Arab Emirates		-55.1323	-47.4643
Japan		-60.0154	
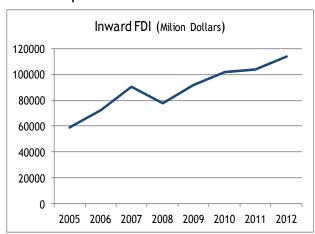
Table 8   The World's Tax Havens and Offshore Financial Centres (subnational areas omitted)

|	OECD 2006	FSF-IMF 2000	TJN 2005
Andorra	X	X	X
Anguilla	X	X	X
Antigua and Barbuda	X	X	X
Aruba	X	X	X
Bahamas	X	X	X
Bahrain	X	X	X
Barbados		X	X
Belgium			X
Belize	X	X	X
Bermuda	X	X	X
British Virgin Islands	X	X	X
Cayman Islands	X	X	X
Cook Islands	X	X	X
Costa Rica		X	X
Cyprus	X	X	X
Dominica	X	X	X
Dubai			X
Gibraltar	X	X	X
Grenada	X	X	X
Guernsey, Sark and Alderney	X	X	X
Hong Kong		X	X
Hungary			X
Iceland			X
Ireland		X	X
Isle of Man	X	X	X
Jersey	X	X	X
Lebanon		X	X
Liberia	X		X
Liechtenstein	X	X	X
Luxemburg		X	X
Macao		X	X
Maldives			X
Malta	X	X	X
Marshall Island	X	X	X
Mauritius	X	X	X
Monaco	X	X	X
Montserrat	X	X	X
Nauru	X	X	X
Netherlands			X
Netherlands Antilles	X	X	X
Niue	X	X	X
Northern Mariana Islands			X
Palau		X	
Panama	X	X	X
St. Kitts and Nevis	X	X	X
Saint Lucia	X	X	X
Saint Vincent and the Grenadir	X	X	X
Samoa	X	X	X
San Marino	X		
Sao Tome e Principe			X
Seychelles	X	X	X
Singapore		X	X
Somalia			X
South Africa			X
Switzerland		X	X
Tonga			X
Turkish Rep. Of Northern Cyprus			X
Turks and Caicos Islands	X	X	X
Uruguay			X
US Virgin Islands	X		X
Vanuatu	X	X	X
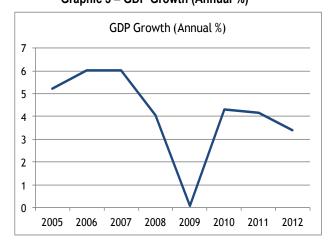
Source: Booijink L. and Weyzig F. (2007), based on OECD (2006) and Financial Stability Forum (2000).
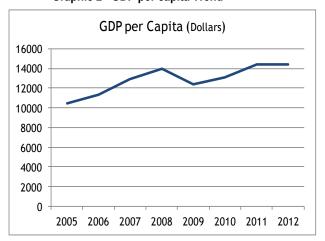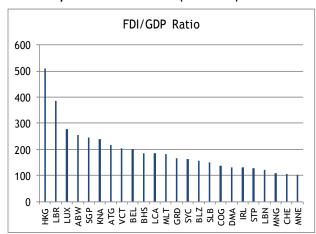
Graphic 1 – INWARD FDI Trend

Inward FDI (Milion Dollars)

Graphic 2 –GDP per capita Trend

GDP per Capita (Dollars)

Graphic 3 – GDP Growth (Annual %)

GDP Growth (Annual %)
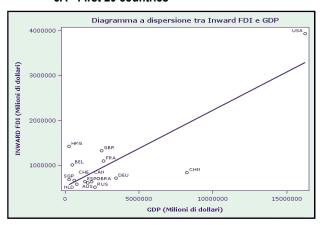
Graphic 4 - FDI/GDP Ratio (2010-2012)

FDI/GDP Ratio
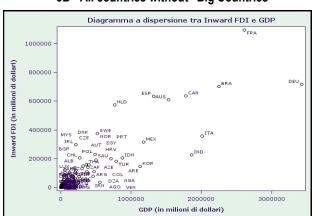
Graphic 5 - Scatter plot Inward FDI e GDP

5A - First 20 countries

Diagramma a dispersione tra Inward FDI e GDP
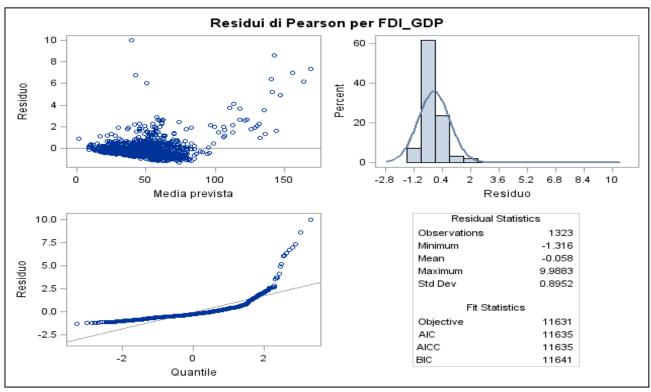
5B - All countries without "Big Countries"

Diagramma a dispersione tra Inward FDI e GDP
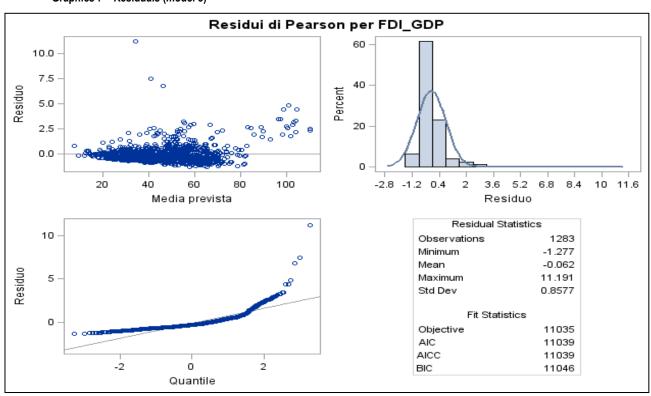
Graphics 6   Residuals (model 2)

Residui di Pearson per FDI_GDP

Residual Statistics	
Observations	1323
Minimum	-1.316
Mean	-0.058
Maximum	9.9883
Std Dev	0.8952

Fit Statistics	
Objective	11631
AIC	11635
AICC	11635
BIC	11641

Graphics 7 – Residuals (model 3)

Residui di Pearson per FDI_GDP

Residual Statistics	
Observations	1283
Minimum	-1.277
Mean	-0.062
Maximum	11.191
Std Dev	0.8577

Fit Statistics	
Objective	11035
AIC	11039
AICC	11039
BIC	11046

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