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Private Equity and Venture Capital Indicators

A Research of EU-27 Private Equity and Venture Capital Markets

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Abstract:

This research investigates market parameters describing the Private Equity and Venture Capital industry in the EU-27.

Building on the review of relevant economic literature and recent surveys, the study identifies a number of meaningful indicators and proposes a model based on three clusters (social, economic, and industrial) not adequately considered in previous analysis.

The model considers general governance indicators such as accountability and regulatory quality as well as economic and industrial ones like the level of Private Equity investments, inflation, and market capitalization of listed companies. The research then evaluates the position of the EU-27 economies vis-à-vis the selected indicators to observe the historical performance of countries and its relation with the EU average.

The study also reviews the limits of the approach and suggests prospects for improvement through additional inferential analysis and through the creation of a Private Equity Market Index (PEMI).

The results are consistent with previous findings of the European Venture Capital Association and confirm the possibility of having a composite benchmark against which to measure Private Equity activity in individual countries.

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Executive Summary

This research analyzes indicators that contribute to the Private Equity (PE) and Venture Capital (VC) activities in EU countries.

It proposes a new framework that expands on the current literature by introducing a model based on three clusters of indicators influencing the PE market: social, economic, and industrial. This multi-faceted approach, not fully explored in previous analysis, allows a more comprehensive assessment of the European PE situation as it provides additional market insight using different types of variables and aggregation.

Based on a literature review, secondary data analysis, and recent European Venture Capital Association (EVCA) surveys, the study has identified a number of indicators that are widely recognized as main contributors to the PE activity (Table1). Specific indicators include *inter alia* the impact of accountability and regulatory quality, the level of Private Equity investments, inflation, and market capitalization of listed companies.

The model has then grouped the indicators into three clusters for which country-level data have been collected over a testing period of 10 years. European trends have been calculated for each indicator, and individual countries have been ranked against this benchmark.

A final aggregation Table at a cluster level (Table 7) consolidates the results and shows the countries that have consistently ranked above the European average for every cluster and during the entire period of analysis.

The proposed approach offers original insight into the PE situation of individual countries over the defined testing period and provides a preliminary score of countries based on the number of times they were above or below the EU average. An important aspect of this paper is its practical use and applicability. Unlike previous research that did not disclose the datasets employed and left wide room for interpretation, this study relies on widely accessible sources so that the model can be easily updated at regular intervals. This approach allows progression and sustainability in the analysis as well as a constant improvement in case new variables are included.

The results update, and are consistent with, previous findings of the EVCA. In particular: (i) the performance of European PE Market is influenced by economic, social and industry-related factors, (ii) meaningful datasets are available from reliable sources allowing comparison over long and significant time series, and (iii) there is the possibility of ranking countries with respect to their relative performance vis-à-vis European trends (averages) in each of the selected indicators.

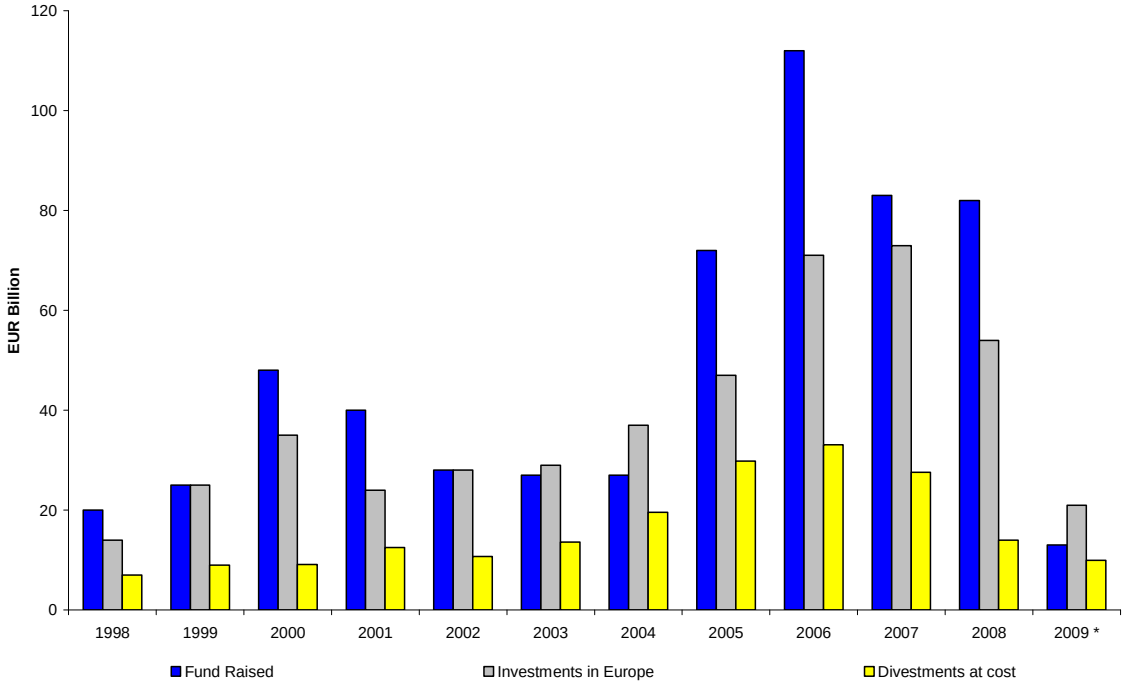
Finally, the study details the limits and identifies possible improvements as next steps of the research. Most importantly, an additional regression and inferential analysis would clarify the link between the proposed indicators and the general PE market performance based on significance levels. Such analysis would enable a proper modelling of the relationship between the PE market and the many independent variables proposed in the study. Ultimately, the panel regression will clarify the importance of microeconomic factors (i.e. tax regimes or business environment) within the EU-27. Regression analysis would also constitute the basis for the creation of a Private Equity Market Index (PEMI) that would allow a comprehensive country scoring.[1]

[1] The research was done during an internship of the author at the EIF and is planned to be the basis for future work in this direction.

1. Introduction and Background of Analysis

Over the past decade the value of Private Equity[2] investments has grown to become an important segment in the international capital markets. Recent statistics demonstrate the sharp evolution in European markets where PE investments increased by 3.7% (year on year) to a record level in 2007 of EUR 73.8 bn (EVCA 2008b) but also a subsequent reduction due to the financial crisis as illustrated in Figure 1.

Figure 1: Yearly evolution of European PE activity by amount (EUR bn)



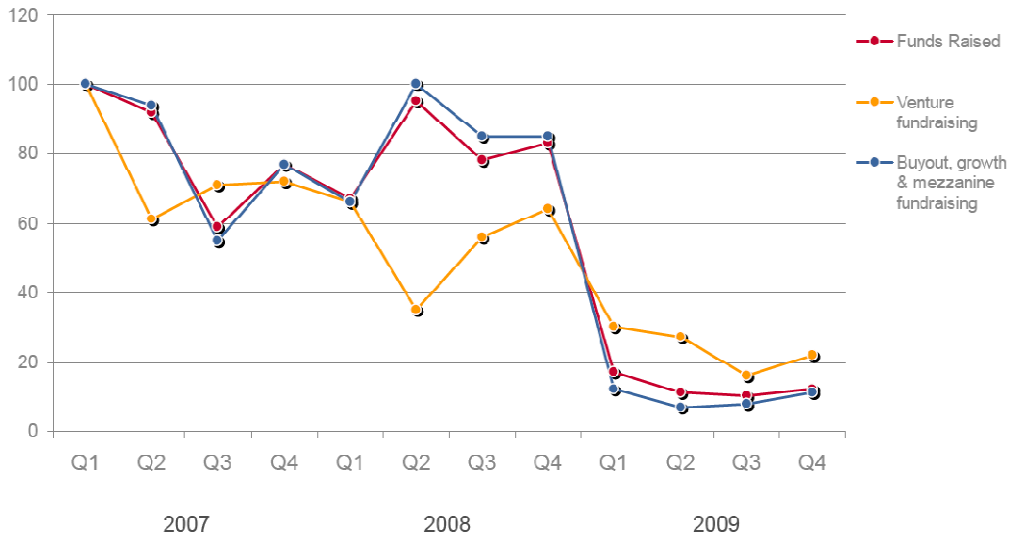
Source: EVCA/PEREP_Analytics for 2007-2009; EVCA/Thomson Reuters/PwC for previous years
**Data for 2009 are preliminary*

The European VC industry appears to be much more integrated than previously believed (Bottazzi, Da Rin, Hellman 2004) and even if the EU market maintains similarities with the US investment practices, some aspects - such as the prominence of banks and corporations as investors - remain distinctively European. Given the incidence of PE investments in the European economy, it is evident how profoundly the PE industry is intertwined with global economic developments and how deeply it is affected by the fluctuations of the market (EIU 2008).

[2] In line with EVCA terminology, the term "Private Equity" is used to designate the full range of private investments including Buyouts, Expansions, and Venture Capital. The terms "Buyouts" and "Venture Capital" are applied when referring to specific segments of the market.

As a consequence, the European PE sector was severely impacted by the financial crisis registering a considerable decrease in capital markets and bank contributions to PE, a significant decrease in investments (-27%), and a dramatic reduction of exit opportunities. All three major dimensions of Private Equity and Venture Capital activity in Europe registered a significant downward trend in 2009: compared to the previous year, 2009 fundraising declined by 86% (Figure 2), investments by 63% and divestments by 30% (EVCA 2009).

Figure 2: European Fundraising activities 2007-2009

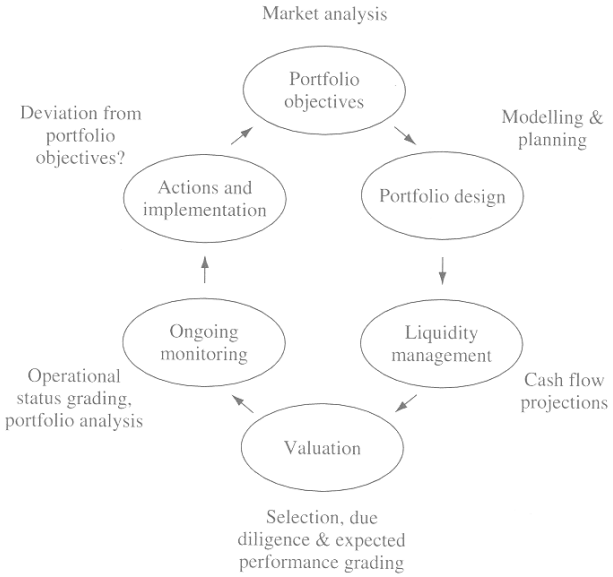


Source: EVCA/Perep Analytics (Q1 2007 =100)

Building on relevant sector studies and with a clear focus on producing a manageable, though basic, reference model, this research aims at identifying the major forces driving the level of activity of Private Equity and Venture Capital in European countries. This effort is made with the assumption that the analysis of past experiences can serve as a basis for understanding the present patterns and constitute an important element when predicting future trends. Moreover, the analysis reinforces the efforts of demystifying the real value of the PE industry which, as expressed in 2007, should not be considered as a panacea for easy returns (European Parliament 2007). As Gottschalg argued, an important challenge in today's PE industry is to reject the illusion of "high Private Equity returns across the board" (Gottschalg 2007). By focusing on different aspects of the PE industry, the proposed model will eventually offer additional insights to the daily work of practitioners through both a quantifiable indicator and graphics for immediate visual realization. As figure 3 illustrates, this research participates in the

investment cycle by offering supplementary considerations on the European PE markets to be used during the analytical process.

Figure 3: Investment Cycle



Source: Mathonet and Meyer 2005

Given the general tendency of PE to keep performance information on individual investments confidential, it is appropriate to structure this research using aggregated datasets publicly available. Additionally, scholarly level research, the European Venture Capital Association (EVCA) publications, and internationally recognized databases, will guide the research in finding relevant indicators for the model.

The Private Equity and Venture Capital market plays a significant role in providing capital to a wide array of enterprises. While a number of authors have examined the value of a Venture Capitalist after an investment is made (Fried and Hirsch 1994, Sahlman 1990, Barry et al. 1990), this research aims at improving Venture Capitalists' decisions making process by identifying relevant indicators of PE activity and by ranking EU-27 countries. As recently argued, economic and social indicators contribute to shape the performance and the overall level of activity of PE and Venture Capital in EU countries (EVCA 2008a, EU Parliament 2007). Those analyses were however lacking an adequate level of clarity and they left ample room when interpreting the indicators. This research aims at bridging this gap by using clearer definitions for every indicator and accessible sources and datasets.

Additionally, in reviewing recent publications, this research notes that the most common use of the social and economic indicators was either to create possible scenarios for PE and VC (EVCA 2008a) or to attempt an international ranking of PE environment worldwide (Apax 2006). Little attention has been devoted to the creation of a comprehensive model for the EU-27 and that leaves sufficient opportunity for producing an original work.

To reach an appropriate level of comparability, the research has accessed different databases but has not collected primary data. While details on the methodology used for each dataset can be found in the annexes, the main sources accessed have been: World Development Indicators (WDI), World Governance Indicators (WGI), EVCA Yearbook, UN Statistics, and IMF datasets.

Interestingly, in April 2008 EVCA interviewed 22 EVCA members and other industry participants and observers to identify, "from the perspective of leading practitioners, the principal drivers that will shape the future of the industry in the years ahead" (EVCA 2008a, p. 10). In an effort to achieve comparable and cross country results, practitioners were selected among both General Partners (GP) and Limited Partners (LP) from different stages in the industry (buyout, venture, secondary, and turnaround) as well as from different geographies (EVCA 2008a). This comprehensive approach based on statistically significant series, was coupled with a second survey of Oxford Analytica focused on macroeconomics, politics, society, the environment, science and technology[3]. The two surveys and their conceptual outcomes constitute the initial base of this analysis as they provide credible insights on the interaction between the PE industry drivers and more general macroeconomic level drivers.

This study has the following structure:

- Indicators and Results

On the basis of the initial findings of the literature review, the chapter will propose a set of relevant indicators to be tested for model suitability.

The model has then grouped the indicators into three clusters for which country-level data have been collected over a testing period of 10 years. European trends have been calculated for each indicator, and individual countries have been ranked against this benchmark.

A final aggregation Table at a cluster level (Table 7) consolidates the results and shows the countries that have consistently ranked above the European average for every cluster and during the entire period of analysis. The proposed approach provides a preliminary score of countries based on the number of times they were above or below the EU average.

[3] Results of EVCA/Oxford Analytica surveys presented in Annex 3.

- Limitations and Next Steps

After having examined the main sources and having identified relevant indicators, this chapter examines the major limitations of the model and it proposes the future steps needed to ensure the sustainability of the model.

- Final Remarks

This final chapter summarizes the way forward and the possible implementations through regression analysis and the creation of a Private Equity Market Index.

2. Indicators and Results

This paper builds on the conceptual categories proposed by EVCA in 2008. In the study, EVCA identified two sets of drivers on which PE industry bases its activities in Europe: Economic Drivers, and Industry Drivers (EVCA 2008a). This dual division however did not sufficiently clarify the drivers of PE in Europe and some EVCA indicators, such as "Development of India and China" or "Talent and skills", were too vaguely described. Therefore, to avoid further problems, the present paper expands and regroups the internationally agreed indicators into new categories, and it adopts measurable datasets from international institutions.

Indicators in the EVCA notation of 2008 can in fact be grouped in a more appropriate manner to reflect the angle of analysis and an integration of the list with governance variables. Relevant drivers are therefore clustered in three categories as follows:

- Social Indicators
- Economic Indicators
- Industrial Indicators

This choice reflects the nature of the various sets of indicators and it better shows how the PE is strongly entwined with the socio-economic aspects of society. For each set of indicators, the research has identified a number of measurable variables collected in secondary databases[4] that can track the development of the PE industry from different sides. The outcomes of the surveys and of the interviews performed by Oxford Analytica in 2007 put a strong focus on the many economic drivers that participate in the PE process (EVCA 2008a) Some of these indicators have been used as key inputs to the scenario planning process. Additional research shows the importance of demographic and social trends in the growth of the private sector (EU Union 2004, IMF 2008) which have not been considered earlier. Differently from other studies whose objective is to identify possible PE scenarios, this paper uses the information collected to classify national PE Markets above or below the EU-27 average.

[4] A list of used sources is available in the annexes.

This initial benchmark allows a first comparison among countries and it provides a decision tool that can be used in the investment decision process. The following Table 1 shows the proposed list of indicators. Please note that future updates of the research and further improvements of the methodology will most likely also lead to an update/adjustment of the set of micro and macro determinants, both in the demand and in the supply side.

Table 1: Indicators by category

Social Indicators	Economic Indicators	Industrial Indicators
• EU population growth (annual %) • Worldwide Governance Indicators (WGI)	• Market capitalization of listed companies (% of GDP) • GDP growth (annual %) • Imports and exports of goods and services (% of GDP) • High-technology exports and patent applications • Foreign direct investment, net inflows (% of GDP) • Inflation (annual %) • Current account balance (% of GDP)	• Fund Raised, Investments, Divestments • Cash surplus/deficit (% of GDP) • Central government debt, total (% of GDP) • Tax Revenues

Source: Author on World Bank, WGI, EVCA 2008a

As noted, this research has developed three clusters of PE indicators building on the review of relevant literature. We believe that this three dimensional approach offers additional insights when analyzing the PE environment as it groups indicators in a tangible manner while bringing conceptual clarity. Further analysis can assess the relative weight of each variable in relation to the model, but this research has assumed all indicators have equal influence on the outcome (Variable weight (w) = 1).

This logical framework also attempts to combine information coming from the financial environment, the legal and policy environment and the entrepreneurial environment. In addition to economic and industrial indicators, the model uses the elaborated measurements of the WGI to capture the legal framework, the accountability of the rules of society, the control of corruption and in general the political stability. Previous researches, including EVCA and Oxford studies, did not considered these variables sufficiently in depth. According to the literature, the short-listed indicators presented in Table 1, have the greatest impact on the environment for Private Equity and are therefore a suitable basis for the model (EVCA 2008a,b, EU 2004, IMF, 2008).

2.1 Social Indicators

As argued by Apax, the world's best markets for Private Equity have similar characteristics which can be seen in a stable regulatory environment, in liberal policies towards private enterprises and an appetite for entrepreneurship (Apax 2006). EVCA shares this vision and has recently stated the importance of the governance system as a major strength of the Private Equity model

and a driver for convergence of interests between GPs and LPs in a fund (EVCA 2008a). For the purpose of this paper, the following indicators are considered:

- EU population growth (annual %),
- The six aspects of the Worldwide Governance Indicators (WGI).

EU population growth (annual %)

The annual evolution of countries' demography provides data for an initial social comparison (World Bank 2008a). As noted, the ageing population in developed economies is a long term tendency which carries major implications for economic performance, asset markets, and consumer behaviour (EVCA 2008a). Overall the dependency ratio (a measure of the number of pensioners per worker), is expected to increase (UN 2006) in line with the trend of baby-boomers. Implications originated by this wave of progressive retirement will be widespread and it will affect both labor and capital markets. This tendency might threaten financial market with a massive sale of financial assets to support retirement consumption but the impact of the ageing population can be mitigated by public policies.

Worldwide Governance Indicators (WGI)

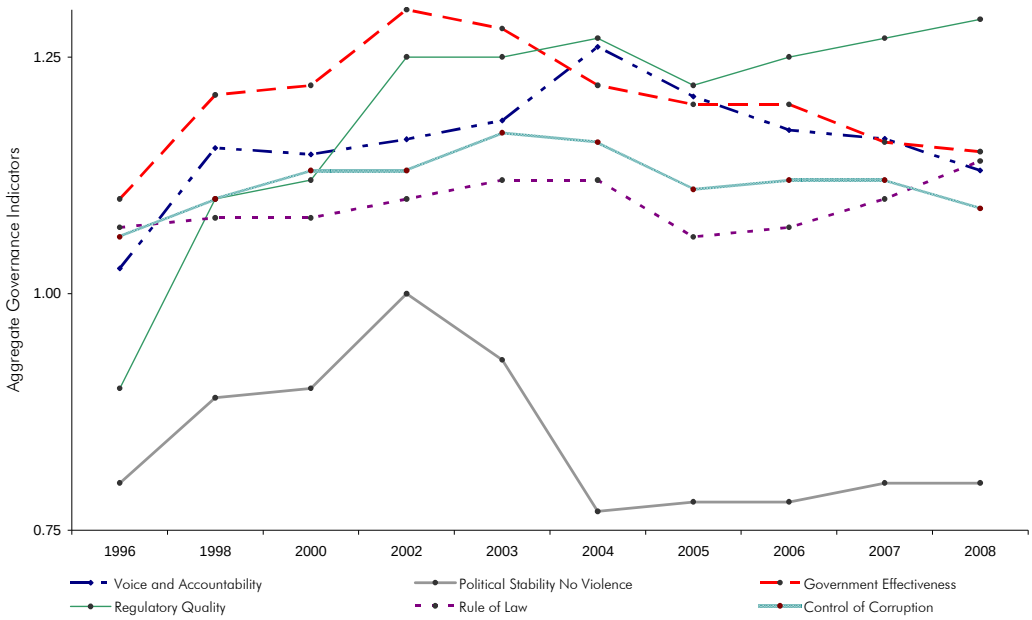
While "*EU population growth*" is a straightforward measurement, the WGIs are a composite measure that reports aggregate and individual governance indicators for 212 countries and territories over the period 1996–2008, for six dimensions of governance. They are:

- Voice and Accountability: the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media.
- Political Stability and Absence of Violence: the likelihood that the government will be destabilized by unconstitutional or violent means.
- Government Effectiveness: the quality of public services, the capacity of the civil service and its independence from political pressures; and the quality of policy formulation.
- Regulatory Quality: the ability of the government to provide sound policies and regulations enabling and promoting private sector development.
- Rule of Law: the extent to which agents have confidence in and abide by the rules of society, including the quality of contract enforcement and property rights, the police, and the courts, as well as the likelihood of crime and violence.
- Control of Corruption: the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests.

As the World Bank specifies, the aggregate indicators combine the views of a large number of enterprises, citizens and expert survey respondents in industrial and developing countries. Methodologically, the individual data sources underlying the aggregate indicators are drawn from a diverse variety of survey institutes, think tanks, non-governmental organizations, and international organizations (World Bank 2008b).

The adoption of this set of indicators in this research, builds on the well documented strong positive correlation between GDP growth (annual %) and the quality of governance across countries (Kaufmann and Kraay 2002, Kaufmann et. al 2008). Given the current research, the indicators confirm the existing evidence on the importance of good governance for economic development. The following Table summarizes the status of WGI in EU-27 countries (averaged) for the period 1996-2008.

Figure 4: EU-27 Averaged WGI 1996-2008 [5]



Source: World Bank WGI 2009

Considering that governance at large has been repeatedly identified as a crucial aspect in the PE industry (Kaufmann and Kraay 2002, Kaufmann et. al 2008, EVCA 2008a, Apax 2006), WGI data offer a solid benchmark against which the EU member states can be evaluated in relation to the six main dimensions of governance. Clearly, WGI tackles the national value of governance rather than on the PE governance specifically (i.e. quality of management). However it is reasonable to expect a positive correlation between levels of national governance and PE specifics (WGI 2008, EVCA 2008a) Also, the indicator offers meaningful cross-country governance comparisons as well as possibilities for constant monitoring progress over time.

[5] This file contains aggregate indicators of six dimensions of governance. The indicators are constructed using unobserved components methodology described in the paper. The six governance indicators are measured in units ranging from -2.5 to 2.5, with higher values corresponding to better governance outcomes. For readability purposes, the Y axis is limited to values ranging from 0.75 to 1.3.

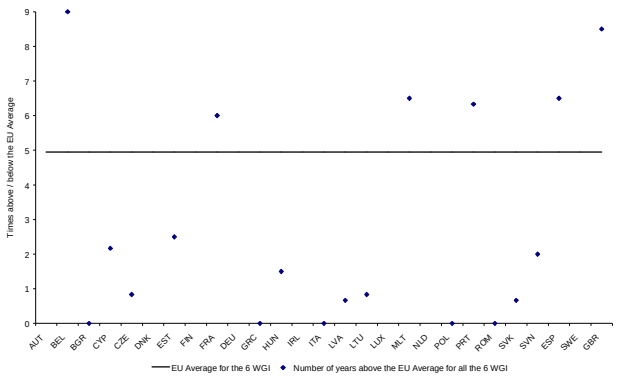
In order to reach an initial level of comparability, this research has aggregated, per category, the information of individual countries during the period of analysis. Figure 5, illustrates binary numeric scores (0, 1) assigned to each EU-27 country with respect to the EU average. A zero value (0) indicates that the country has a value below the EU average for a given indicator in the specified timeframe (year). Conversely, a value of one (1) signifies that in the specific year, the country achieved results higher than the EU-27 average for the given indicator. The sum of the different binary values of the three clusters of indicators, gives an average of averages and it exemplifies the number of times (years) a given country has scored above or below the EU average. The following formula exemplifies:

$1 = x_C \geq \bar{x}$ and $0 = x_C < \bar{x}$ where x_C indicates the value of a country and $\bar{x}$ is the EU average expressed as: $\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$.

In general terms, a value "above the EU average" can be seen as "better than" the average. However this can be interpreted differently in case of indicators such as inflation or current account deficit where a value above the EU average produces negative effects on the PE industry. Graphics in Annex 4 illustrate individual indicators.

As per our analysis, over the period 1998-2008, the EU average for the selected social indicators was 4.94 (Figure 5). There are however a number of countries that constantly scored above the EU average (during the 10 years of analysis), and others that constantly scored below the average. Figure 5 summarizes the findings over the ten years period (1998-2008).

Figure 5: Comparison Aggregate data 1998-2008 for Social Indicators [6]



Source: Author on WGI 2009.

[6] The graphic indicates the number of times a country has scored above or below the EU-27 average during the period 1998-2008 for the social aggregate. A "0" value means the country was never above the European mean during the period of analysis; a 9 value, means the country has been above the average every year during the period. Given this is composite index, intermediate values are possible. Data from WGI excluding Demographics. Detailed graphics of each social indicator can be found in the annexes.

2.2 Economic Indicators

In selecting relevant economic drivers the research was challenged by the need of finding relevant and measurable indicators that can be updated regularly. To that extent the main source of economic data has been the World Development Indicators (WDI) of the World Bank. An important methodological notation in the adoption of the WDI is that the World Bank is not a primary data collection agency for most areas other than business and investment climate surveys, living standards surveys, and external debt. It is therefore important to acknowledge the differences in the methods and in the conventions used by primary data collectors – usually national statistical agencies and central banks – as these differences may rise to significant discrepancies over time both within countries and across them (World Bank 2008).

All the indicators are expressed in percentage to avoid any bias in the advancements of smaller economies. As illustrated by Table 1 and in line with the relevant literature (EVCA 2008a, EVCA 2008b, Apax 2006), the following indicators have been selected as meaningful benchmark of the economic cluster:

Market capitalization of listed companies (% of GDP)

The market capitalization is a measurement of corporate or economic size equal to the share price times the number of shares outstanding of a public company. As owning stock represents owning the company, capitalization could represent the public opinion of a company's net worth and is a determining factor in stock valuation. Likewise, the capitalization of stock markets or economic regions may be compared to other economic indicators. Considering the relevant expectations of Venture Capital on capital markets (Mathonet and Meyer 2005) the relevance of this indicator is clear. Additional analysis can demonstrate the positive correlation between market cap and the PE market.

GDP growth (annual %)

GDP growth is a widely used, intuitive indicator of the overall status of the economy. It compares the annual output growth in the latest calendar year in comparison with the previous year.

Imports and exports of goods and services (% of GDP)

Imports and exports express the value of all goods and services provided to or received from the rest of the world. This indicator captures the role and the impact of goods and services in the country GDP. Particularly relevant is the interaction of imports and exports with the development of other countries. In the mentioned survey from Oxford Analytica (EVCA 2008a),

many participants mentioned the development of China and India as the most relevant economic events of recent era.

According to the EVCA study, the development of China and India will have a defining impact on the way the world looks in 2020 (EVCA 2008a). The potentials for a greater opportunity for Private Equity will largely depend on the extent to which China and India favour openness and FDI over state control.

High-technology exports and patent applications

These two indicators examine the contributions of talents and skills into the PE industry. As argued by EVCA, the fundamental advantage of Private Equity over other asset classes is the ability to attract the best talents from around the world to weather industry's challenges and guarantee success. In searching measurable and meaningful indicators in the real economy, this research has found in the high technology exports and patent applications, valuable dataset that can suitably describe the dynamics.

Foreign direct investment, net inflows (% GDP)

FDI net inflows report the net inflows of investment to acquire a lasting management interest in an economy other than that of the investor. FDI constitutes an example of integration with the global economy and is a good indication of how the EU-27 economy is seen from the outside world as it indicates where foreign countries are interested to invest.

Inflation (annual %)

Selected inflation indicators measure the average annual rate of price change in the economy as a whole (GDP implicit deflator) and the changes in the cost to the average consumer of acquiring a basket of goods and services that may be fixed using the Laspeyres formula (consumer price index). Variations are expressed in annual GDP %, in order to allow comparability within different EU economies.

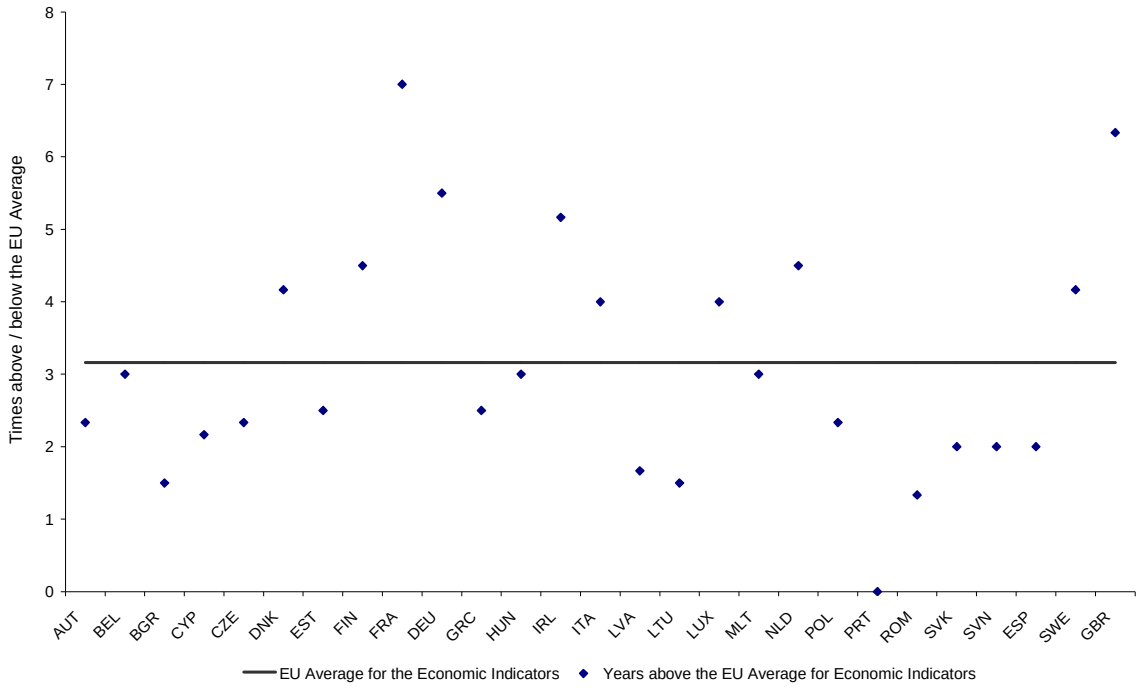
Current account balance (% of GDP)

The balance of payments records economic transactions between one economy and the rest of the world. Numerically, this is the sum of net exports of goods and services, net income, and net current transfer, and it is particularly significant in this research as it introduces the importance of capital transfer in the EU economies and complements FDI data.

Graphics in Annex 4 illustrate the status of individual countries in respect to EU standards. Over the period 2000-2008, the standard EU value (EU average) was 3.16 for the mentioned

economic indicators. A number of countries constantly scored above the EU average (during the entire period of analysis) while others consistently registered value below the average (during the entire period of analysis). Figure 6 exemplifies:

Figure 6: Comparison Aggregate data 2000-2008 for Economic Indicators [7]



Source: Author on WDI 2009

2.3 Industrial Indicators

This last set indicators is the most closely linked to PE industry *per se*. Findings and literature show that despite the recent global financial turmoil, EU Private Equity activity remains strong, as reflected by the new investment amounts, and attractive to investors, as reflected by the fundraising trends (EVCA 2008b). Recent downturns are however exemplified in Figure 1.

Funds Raised, Investments, Divestments

Data on PE fundraising, investments and divestments are the first, intuitive measures of the status of the industry at large. After an exceptional year 2006, the EU fundraising scaled back in 2007 by approximately 30% and it registered a second strong reduction in 2008 and 2009 as result of the recent crisis. On the investment side, the amount invested reached a new record in 2007 at 73.4 billion Euros with subsequent reductions in 2008 and 2009. On the

[7] The graphic indicates the number of times a country has scored above or below the EU-27 average during the period 2000-2008 for the economic aggregate. A "0" value means the country was never above the European average during the period of analysis; a "7" value, means the country has been above the average every year during the whole period. Given this is composite index, intermediate values are possible. Additional graphics of each social indicator can be found in the annexes.

divestment side since 2007, exits decreased by amount divested at cost and by number, and the emphasis was put on sales to other Private Equity houses. According to EVCA this was the first time when this divestment method exceeded the trade sales even if by a small margin (EVCA 2008b).

Cash surplus/deficit (% of GDP)

The cash surplus or deficit is calculated as revenue (including grants) minus expense, minus net acquisition of non-financial assets. This cash surplus or deficit is closest to the earlier overall budget balance (still missing is lending minus repayments, which are now a financing item under net acquisition of financial assets). Given its close link with political economics and national fiscal policies, this indicator provides an overview of the size and role of central governments relative to national economies.

Central government debt, total (% of GDP)

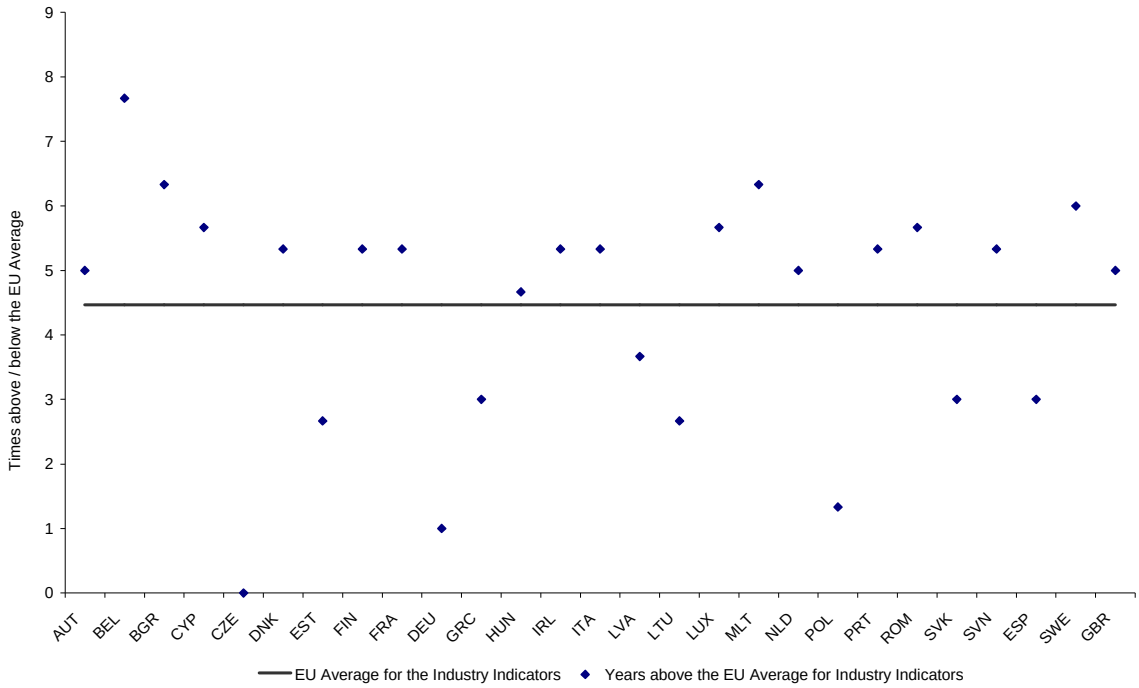
Over the past few years, the debt market in general and PE industry specifically, benefited from very liquid capital markets and extremely favourable conditions in the debt markets. Long term interest rates have fallen and spreads have tightened, reducing borrowing costs and increasing the amount of leverage that can be applied in buyout deals (EVCA 2008a). The relevance of this indicator in economic terms relies on the possible negative impact that government debt might produce on real economic growth. Given the importance of fiscal policy in the PE industry (EVCA 2008a), this research has grouped cash surplus/deficit, central government debt and tax revenues as part of the industrial indicators. Such indicators can alternatively be considered as part of the economic cluster.

Tax Revenues

The tax regime is a fundamental component to the economics of Private Equity as any change in the tax level would immediately (and negatively) impact the industry. As noted, recent criticism has centred on the preferential tax treatment that debt finance receives vis-à-vis equity finance as a result of the deductibility of interests (EVCA 2008a).

Over the period 2000-2008, the EU average for the industrial indicators was 4.47 and, as Figure 7 exemplifies, a number of countries were consistently beating the average.

Figure 7: Comparison Aggregate data 2000-2008[8] for Industrial Indicators



Source: Author on WDI; EVCA;

NB. The graphic does not consider data on fund raised, Investments and divestments.

2.4 Other Considerations

As previously specified, the scope of this research is to provide a tool to rapidly analyze the status of the PE markets in EU-27 under different perspectives. There is a need therefore to design a tool which is easy to maintain and read. While further complications can be envisaged in a second phase of the project, the approach taken identifies a convenient solution that can be immediately adopted. The major challenge of analysis remains the meaningfulness of the datasets adopted. While additional significance tests for the selection of indicators are needed to explore the strength and the direction of the relationship between the variables selected, Table 2 introduces correlation examples among variables of analysis. It exemplifies the positive correlation among selected indicators belonging to different categories. In probability theory and statistics, correlation indicates the strength and direction of a linear relationship between two random variables and to that extent it refers to the departure of two random variables from independence. The method used in the estimation is the Pearson product-moment correlation coefficient, which is obtained by dividing the covariance of the two variables by the product of their standard deviations. Table 2 shows the relevance of the

[8] The graphic indicates the number of times a country has scored above or below the EU-27 average during the period 2000-2008 for the industrial aggregate. A "0" value means the country was never above the European mean during the period of analysis; an "8" value, means the country has been above the average every year during the period. Given this is composite index, intermediate values are possible.

proposed set of indicators, however, as indicated in chapter 3 "Limitations and Next Steps", additional regression and inferential analysis should be performed on all the variables considered in the study. Given the large number of variables and the nature of this study, the following Table is in fact only exemplificative of the correlation among representative indicators only.

Table 2: Correlations among selected indicators[9]

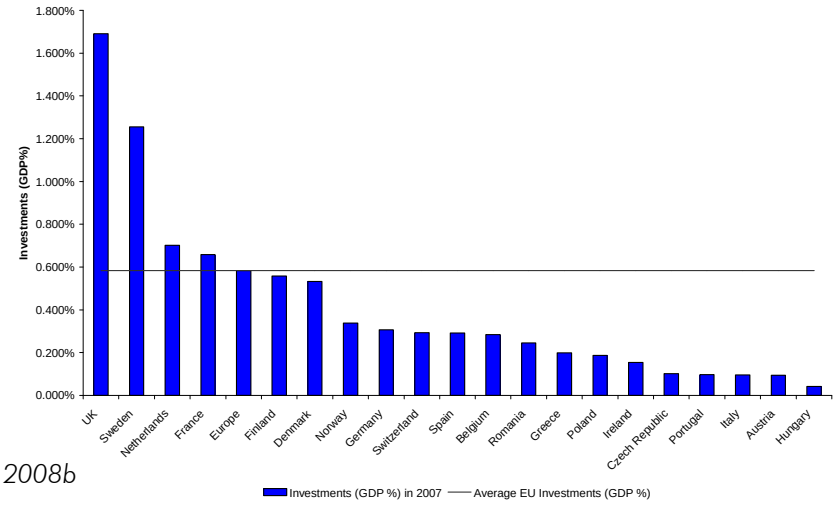
Indicators	Category	Correlation method	EU Population Growth %	EU GDP Growth %	Fund Raised	Investments	Divestments
EU Pop. Growth %	Social	Pearson	1.000	.435	.558	.789*	.838**
EU GDP Growth %	Economic	Pearson	.435	1.000	.759	.795*	.604
Fund Raised	Industrial	Pearson	.558	.759	1.000	.904**	.865**
Investments	Industrial	Pearson	.789*	.795*	.904**	1.000	.883**
Divestments	Industrial	Pearson	.838**	.604	.865**	.883**	1.000

* Correlation is significant at the 0.05 level (2-tailed). ** Correlation is significant at the 0.01 level (2-tailed).

Source: Author

An immediate determinant of the PE industry sector can be the overall amount of PE investments expressed in GDP %. According to many, the percentage of GDP invested in PE requires a profound market confidence and demonstrates a deep trust in market governance (EVCA 2008b, Apax 2006). It is therefore reasonable to derive from such percentage a preliminary indication of the PE market environment. In 2007, the EU PE Market was as follows:

Figure 8: Private Equity Investments in EU as GDP % in 2007



Source: EVCA 2008b

[9] As already mentioned, additional correlation and regression analysis will need to be performed in the research update.

The above graphic leads to a preliminary possible ranking of EU countries as follows:

Table 3: EU clusters of countries by Investments as GDP % in 2007

Cluster 1: Investment more than 1% of GDP	Cluster 2: 0.51 < Investment < 1% of GDP
UK, Sweden	Netherlands, France, Finland, Denmark
Cluster 3: 0.2 < Investment < 0.5% of GDP	**Cluster 4: 0.041 < Investment < 0.2% of GDP**
Germany, Spain, Belgium, Romania, Greece, Poland,	Greece, Poland, Ireland, Czech Republic, Portugal, Italy, Austria, Hungary

Source: Author on EVCA data (2008b).

While giving an immediate (and incomplete) ranking, the above methodology lacks sufficient considerations of other variables driving the performance of the PE industry as it only considers the PE investments as % of GDP. This data however integrates the other variables with additional information allowing the model to capture the impact of social, economic, and industrial drivers on Private Equity in EU-27.

2.5 Results

The proposed model allows an initial, though limited, comparison among countries in the three key macro areas of the PE market. The Tables below summarize the results for each cluster and it groups countries in relation to their score with respect to the EU general trend (benchmark). As indicated in Figures 5, 6 and 7, the following Tables summarize the countries that were constantly above or below the EU average for the different clusters.

Table 4: Social Indicators

Social Indicators		
Countries above the Average for the whole period 1998-2008*	Austria Belgium Denmark Finland France Germany Ireland	Luxembourg Malta Netherlands Portugal Spain Sweden United Kingdom
Countries below the average for the whole period 1998-2008 *	Bulgaria Cyprus Czech Republic Estonia Greece Hungary Italy	Latvia Lithuania Poland Romania Slovakia Slovenia

*Source: Author on WGI 2009; WDI 2009 * Unless otherwise specified in the dataset*

Table 5: Economic Indicators

Economic Indicators		
Countries above the Average for the whole period 1998-2008*	Denmark Finland France Germany	Ireland Luxembourg Netherlands Sweden United Kingdom
Countries below the average for the whole period 1998-2008 *	Austria Belgium Bulgaria Cyprus Czech Republic Estonia Greece Hungary Italy Latvia	Lithuania Malta Poland Portugal Romania Spain Slovakia Slovenia

Source: Author on WDI 2009

Table 6: Industrial Indicators *

Industrial Indicators		
Countries above the Average for the whole period 1998-2008*	Austria Belgium Bulgaria Cyprus Denmark Finland France Hungary Ireland	Italy Luxembourg Malta Netherlands Portugal Romania Slovenia Sweden United Kingdom
Countries below the average for the whole period 1998-2008 *	Czech Republic Estonia Germany Greece	Latvia Lithuania Poland Slovakia Spain

*Source: Author on WDI 2009; EVCA 2008b * Excluding data on fundraising, investments, and divestments.*

As a final step, the model identified those countries that have consistently ranked above the EU average for each cluster (social, economic, and industrial) and during the whole period of analysis (1998-2008). Table 7 shows those "virtuous" countries that over the period of analysis scored consistently higher than the EU average in every angle: social, the economic and the industrial.

Table 7: Summary of Indicators

Summary of Indicators		
Countries constantly above the average in all the categories (social, economic, industrial)	Denmark Finland France Ireland	Luxembourg Netherlands Sweden United Kingdom
Countries constantly below the average in all the categories (social, economic, industrial)	Czech Republic Estonia Greece	Latvia Lithuania Poland Slovakia

Source: Author on WDI 2008; WGI 2008, EVCA 2008b

Policy decisions and national investment strategy into PE can rapidly originate from Table 7. If compared with Figure 8 (Private Equity Investments as % of GDP), it is evident how all the countries above the average in Table 7 have invested extensively in Private Equity [10]. On the other hand, countries with limited investments in Private Equity were also scoring below the EU average for all the indicators (Table 7). As indicated, there are signs of a positive correlation between GDP growth % (including GDP % invested in PE) and PE Investments (Table 2). Additional correlation analysis would clarify the strength of the relationship and its link with the other clusters of analysis.

3. Limitations and Next Steps

The paper is an initial contribution to describe the interrelation among the relevant indicators of the PE Market in EU-27. Even though the proposed model suggests a preliminary scoring and identifies some findings, it still contains a number of limitations that prevent it from being comprehensive. Notably, the findings demonstrate the need of an additional examination of the microeconomic factors (i.e. tax environment and business environment) within the homogenous group of EU-27 economies. The major constraints of the research and the suggestions for future development are presented hereby:

(i) The data presented in this report consist of descriptive statistics and simple-cross tabulations based on secondary data analysis. To provide a more complete study on the behaviour of the EU PE and VC industry, it would be necessary to consider a more comprehensive conceptual framework, in which additional statistical techniques like multivariate panel regressions are used to better evaluate the statistical relationships between the variables of interest. Additionally, the indicators have been selected mainly through a literature analysis with limited time devoted to perform correlation calculations and additional significance tests.

(ii) This research might possibly generate a lively debate around the meaningfulness of the chosen indicators. Even if the current list of variables is based on cutting-edge economic literature review, there is a possibility for improving the selection with the adoption of additional meaningful indicators. The list is clearly non exhaustive but it balances between data availability and meaningfulness.

When analyzing the possible alternatives, the selection has to consider the internal needs of the model that has to be updated on a regular basis. There is therefore a pressing need for long term reliable (and accessible) datasets on which both descriptive and inferential statistics can be calculated. In selecting the variables of the cluster, the study has reviewed sources from the

[10] Except for Ireland, Finland and Luxembourg which are not present in Fig. 8.

World Bank (WDI, and WGI), IMF (WEO, and GSFR), EVCA, Eurostat and the ECB. Amendments in the selection of indicators should therefore consider the above when proposing new datasets.

(iii) Regarding the data collection process, the research has noted the adoption of different methodologies in the datasets used. This leads to possible problems of standardization among variables and a normalization process can be envisaged as crucial step. This normalization process can be formalized through the standard score (z) which equals to:

$$z = \frac{\chi - \mu}{\sigma}$$

where: χ is a raw score to be standardized, μ is the mean of the population, and σ is the standard deviation of the population. This dimensionless quantity subtracts the population mean from the individual raw score and divides the difference by the indicator standard deviation. This conversion process indicates how many standard deviations an observation is above or below the mean and it allows comparison of observations from different normal distributions. Such considerations are also linked to an important underlying assumption in the calculations. Estimated values have always assumed an equal weight among the different variables of the model. Additional analysis can identify different weights among variables to be reflected in the final average and in the descriptive statistics.

(iv) In terms of time series, a further development of the study can imply longer datasets to collect additional information and evidence. Currently the data span from 1998 to 2008 can provide significant results, however the used datasets can be extended to consider longer time series.

(v) Additional research can address frequency distributions of EU countries for the given indicators. This can further reinforce the testing with an assessment of differences and similarities between frequency distributions. While this paper has concentrated mainly on measurements of central tendencies, further research can offer extra insight on the statistical dispersion, such as the standard deviation or variance.

The present research is foreseen to be revisited during the second half of 2010. In that occasion, a survey among market practitioners might lead to an update of the relevant set of micro and macro determinants in both the demand and supply side. Moreover, the integration of panel regression in the model will test the determinants and drivers. Furthermore, additional inferential analysis as well as hypothesis testing can be performed.

Another important improvement to be performed will be the creation of a Private Equity Market Index (PEMI). This index should capture the relevant aspects driving the performance of PE EU markets and consequentially rank the 27 EU countries. After having identified the suitable list of micro and macro indicators, the first step in this exercise would be to define a measure of "PE deficit" a country suffers in each of the three basic sets of variables namely social, economic, and industrial. A maximum and a minimum value would then be determined for each of the three variables given the actual values. The "PE deficit" measure then places a country in the range of zero to one as defined by the difference between the maximum and the minimum. Thus I_{ij} is the deficit indicator for the *j*th country with respect to the *i*th variable and it is defined as:

$$\mathrm{I}_{ij} = \frac{(\max X_{ij} - X_{ij})}{(\max X_{ij} - \min X_{ij})} \qquad (1)$$

A second step would be to define the average PE Indicator (I_j) by taking a simple average of the three indicators:

$$I_j = \sum_{i=1}^{3} I_{ij} \qquad (2)$$

The third step would finally measure the PE Market Index (PEMI) as one minus the average PE Indicator:

$$\text{PEMI} = (1 - I_j) \qquad (3)$$

4. Final Remarks

In this paper we have analyzed parameters driving the Private Equity and Venture Capital industry in EU-27. Building on the relevant literary review, we have integrated the current analysis with a new a set of meaningful indicators and proposed a model that tackles social, economic, and industrial aspects of the PE market.

Methodologically, the research has firstly collected data for each indicator and for the 27 EU countries over an initial period between 1998 and 2008[11]. Secondly, the study has calculated the normal average of each indicator and, in a binary system mode, it has assigned a 0 or a 1 value to show countries' ranking above the EU average (value = 1) or below the EU average (value = 0). This approach allows an immediate comparison among countries and EU average as shown in the graphics (Figures 5, 6, 7). Thirdly, country-level results have been aggregated over the period of analysis to calculate the number of times a given country scored above or below the EU average for the given set of indicators (Table 7).

[11] Unless otherwise specified.

The methodology is based on secondary data analysis and it combines new sets of variables to create a preliminary, yet solid, cross-country comparison. Differently from the main literature that identifies indicators to forecast possible scenarios of the market (EVCA 2008a), this study provides additional information on the status of the EU-27 PE market building on a new logical framework of analysis.

Correlation among variables (Table 2) shows the relevance of the approach and the preliminary meaningfulness of the indicators. However additional correlation and regression studies are required to clarify the link between the proposed indicators and the general PE market performance. Such analysis would realize a proper modelling of the relationship between the PE market and the independent variables in the study.

The author invites comments from readers in relation to the methodology, the structure of the research and preliminary findings.

Annex 1: Country Details

European countries considered in the analysis:

Country	Code
Austria	AUT
Belgium	BEL
Bulgaria	BGR
Cyprus	CYP
Czech Republic	CZE
Denmark	DNK
Estonia	EST
Finland	FIN
France	FRA
Germany	DEU
Greece	GRC
Hungary	HUN
Ireland	IRL
Italy	ITA
Latvia	LVA
Lithuania	LTU
Luxembourg	LUX
Malta	MLT
Netherlands	NLD
Poland	POL
Portugal	PRT
Romania	ROM
Slovakia	SVK
Slovenia	SVN
Spain	ESP
Sweden	SWE
United Kingdom	GBR

Annex 2: List of Standard-Acronyms[12]

- **CEE:** Central and Eastern Europe
- **CEECs:** Central and Eastern European Countries
- **CIP:** Competitiveness and Innovation Programme*
- **EBRD:** European Bank for Reconstruction and Development
- **EC:** European Commission
- **EIB:** European Investment Bank
- **EMN:** European Microfinance Network
- **ERDF:** European Regional Development Funds
- **ESF:** European Social Funds
- **EU:** European Union
- **GIF:** High Growth and Innovative SME Facility
- **GP:** General Partner
- **GS:** Guarantees & Securitisation
- **IFC:** International Finance Corporation
- **IFI:** International Financial Institution
- **IMF:** International Monetary Fund
- **IRR:** Internal Rate of Return
- **IVCI:** Istanbul Venture Capital Initiative
- **Jasmine:** Joint Action to Support Micro-finance Institutions in Europe
- **Jeremie:** Joint European Resources for Micro to Medium Enterprises
- **KTO:** Knowledge Transfer Office
- **LMM:** Lower Mid Market
- **LP:** Limited Partner
- **MAP:** Multi-annual Programme*
- **MFI:** Microfinance Institution
- **MSEs:** Micro and small enterprises
- **NBA:** Nordic – Baltic Area
- **NGO:** nongovernmental organisation
- **OECD:** Organisation for Economic Co-Operation and Development
- **PE:** Private Equity
- **P/E ratio:** Price/Earnings ratio
- **PVCI:** Portugal Venture Capital Initiative
- **RCM:** Risk Capital Mandate
- **SMEs:** Small and medium sized enterprises
- **SMEG:** SME Guarantee Facility
- **SRI:** Social Return Investment
- **TT:** Technology Transfer
- **TTO:** Technology Transfer Office
- **UNU:** United Nations University
- **VC:** Venture Capital
- **VCs:** Venture Capitalists

[12] Please note that not necessarily all mentioned acronyms are used in this document.

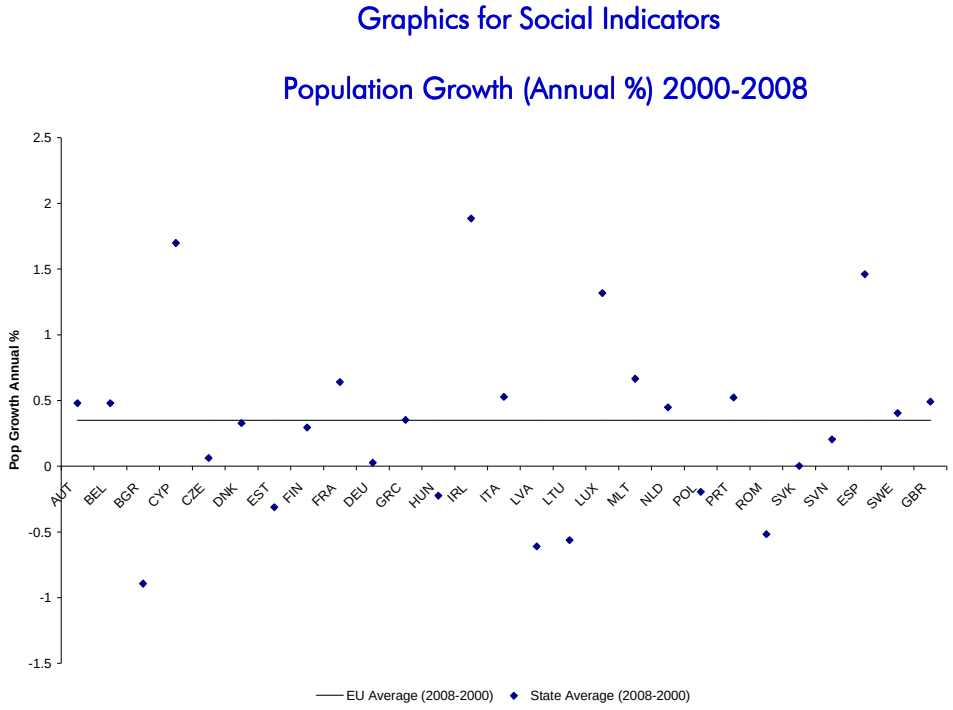
Annex 3: EVCA Datasets

The European Venture Capital Association (EVCA) has been cited repeatedly in this paper and it constitutes a reference benchmark for the European Private Equity activity. From the following Table, showing the EVCA drivers of the PE Market, the research have developed the list indicated in the Table 1.

EVCA Economic Drivers	EVCA Industry Drivers
Spread of Anglo-Saxon capitalism	Industry regulation
Ageing population	Public perception of the industry
Development of India and China	Cost and availability of debt
Economic and financial integration	Taxation
Innovation capability in Asia	Political attitudes
Attitudes towards foreign ownership	Governance
Development of alternative energy resources	Public-private dynamics
Financial stability	Talent and skills
Disintermediation in credit markets	Supply of capital
New technology	

Source: EVCA 2008a

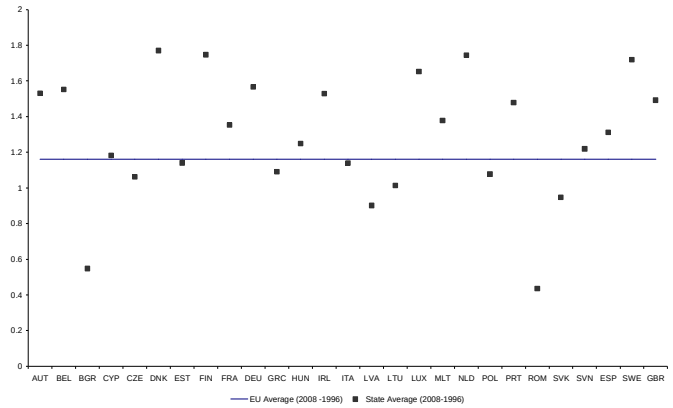
Annex 4: Graphics



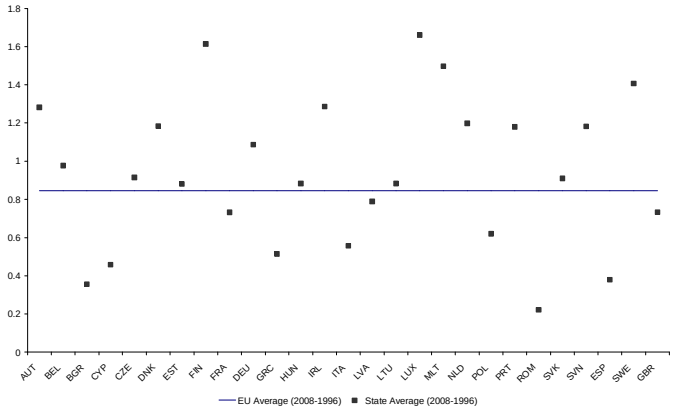
Source: Author on WDI 2009

WGI Aggregate Comparison (EU Average for years 1998-2008 vs State average 1998-2008)

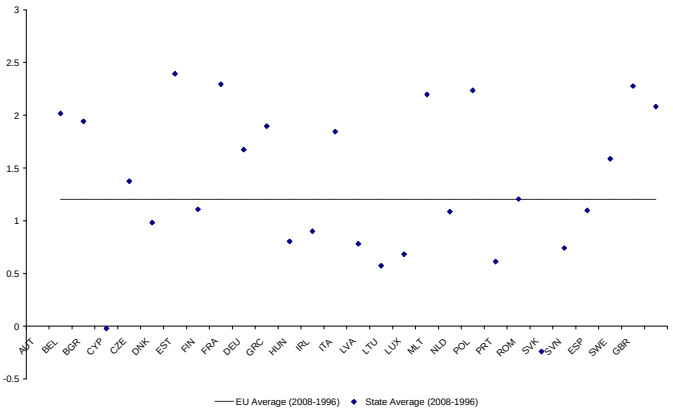
Voice and Accountability



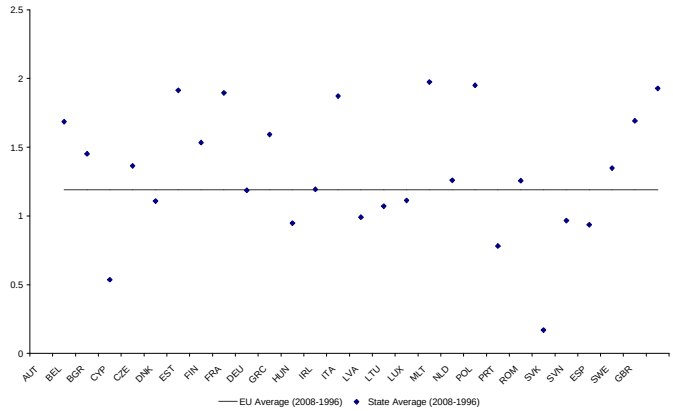
Political Stability & Absence of Violence/Terrorism



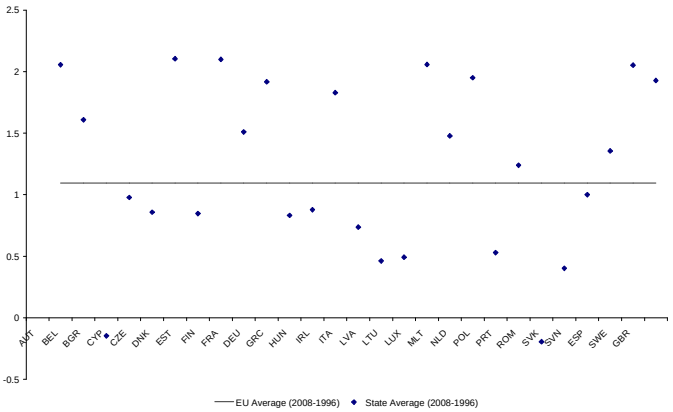
Government Effectiveness



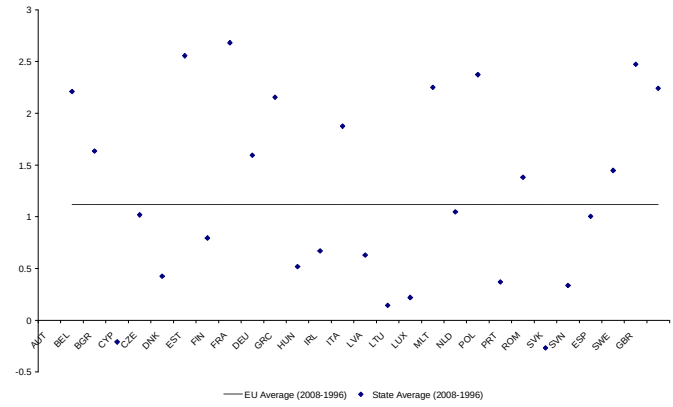
Regulatory Quality



Rule of Law



Control of Corruption

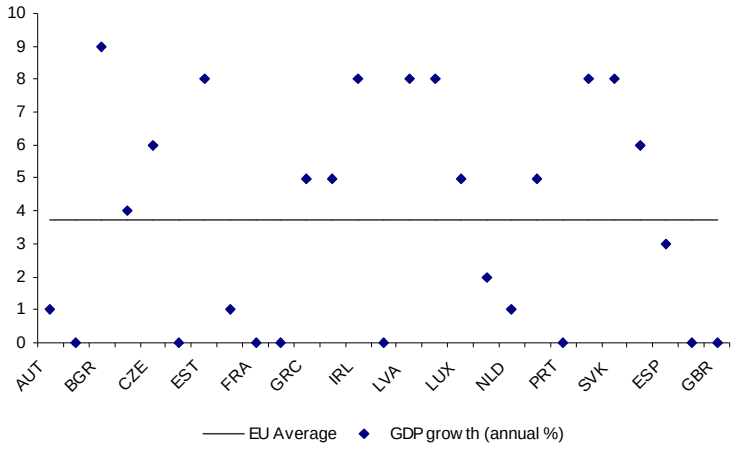


Source: Author on WGI 2008

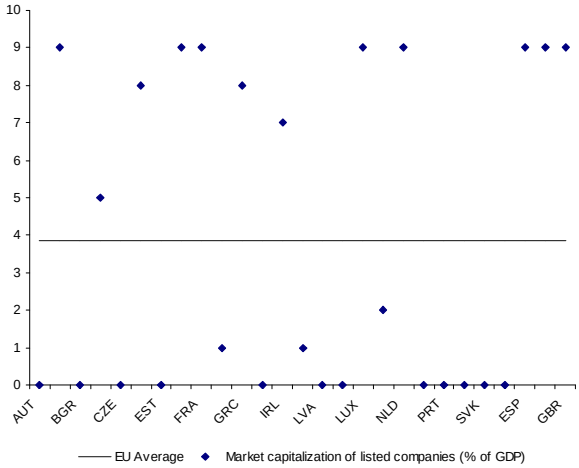
The six governance indicators are measured in units ranging from about -2.5 to 2.5 as indicated in the x axis, with higher values corresponding to better governance outcomes.

Graphics for Economic Indicators

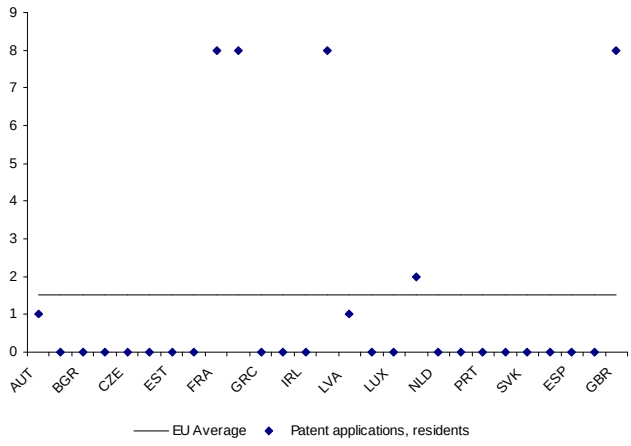
GDP growth (annual %)



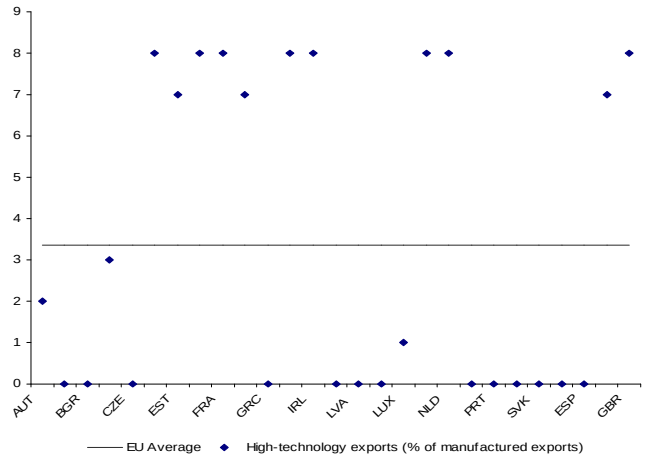
Market capitalization of listed companies (% of GDP)



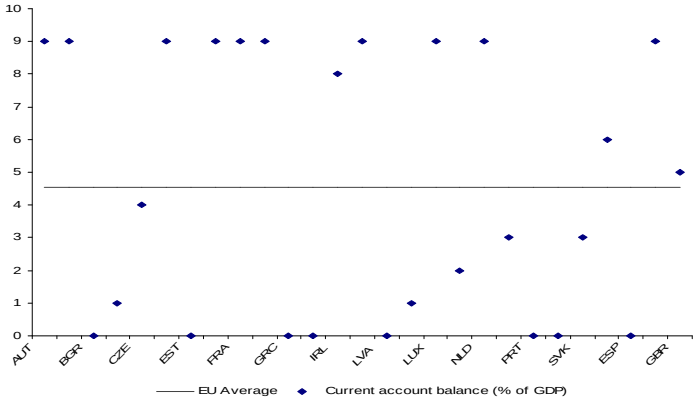
Patent applications, resident



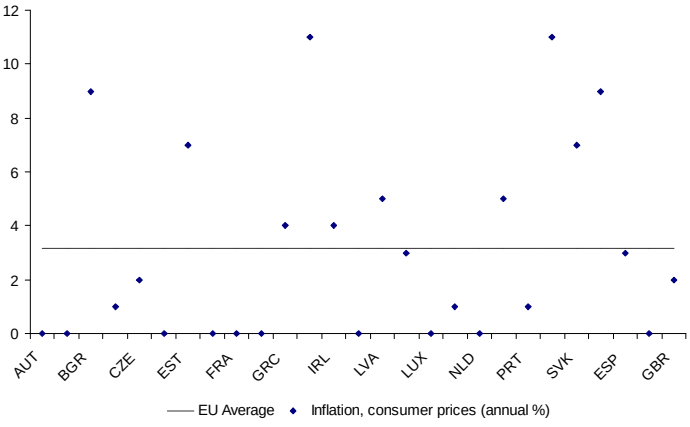
High-technology exports (% of manufactured exports)



Current account balance (% of GDP)



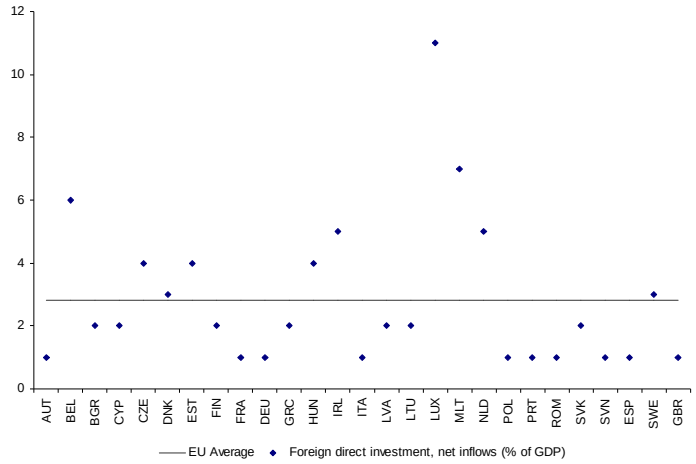
Inflation, consumer prices (annual %)



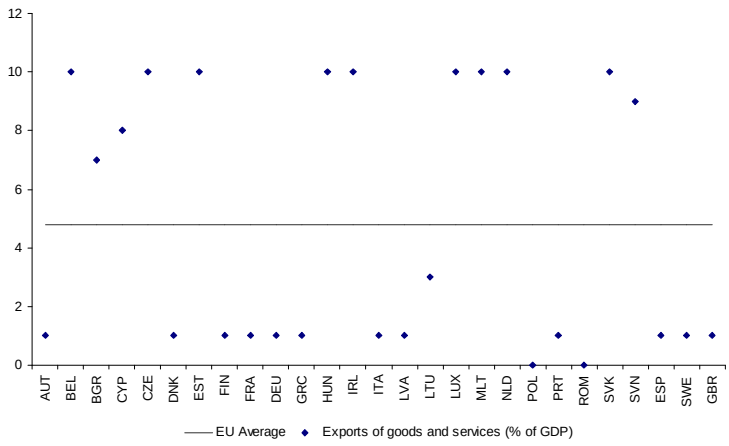
Source: Author on WDI et al. 200

Graphics for Economic Indicators (cont.d)

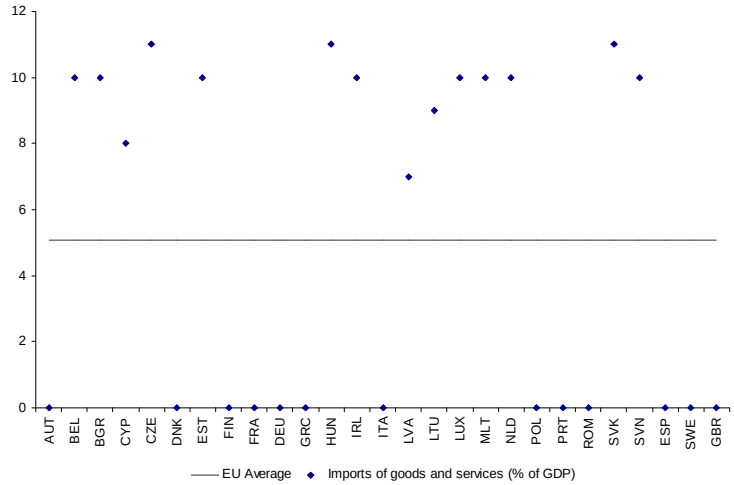
Foreign direct investment, net inflows (% of GDP)



Exports of goods and services (% of GDP)



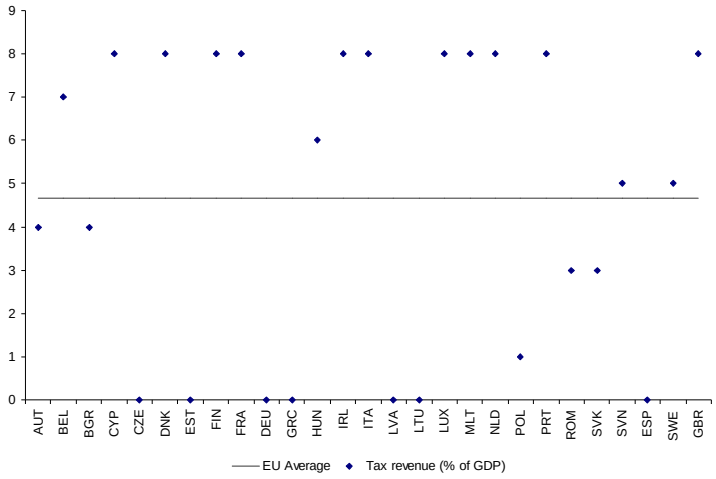
Imports of goods and services (% of GDP)



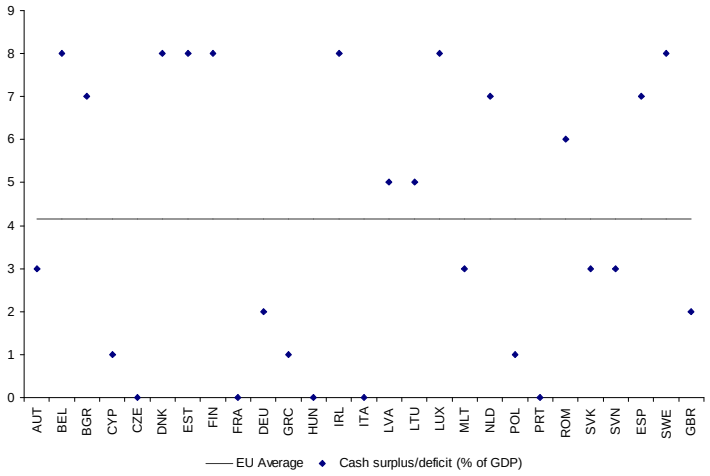
Source: Author on WDI et al. 2007

Graphics for Industry Indicators

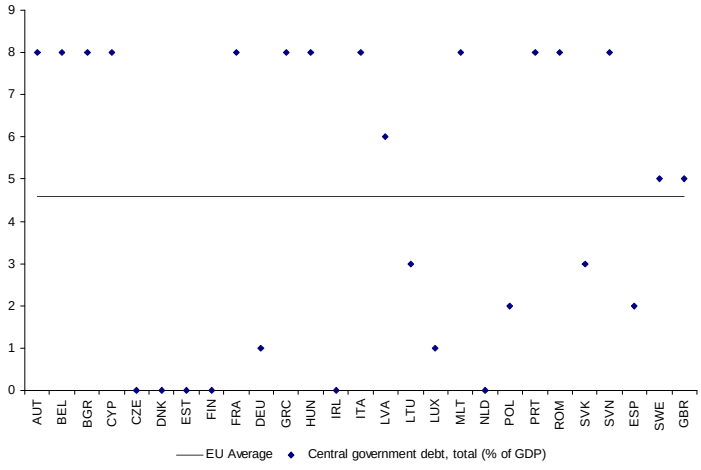
Tax revenue (% of GDP)



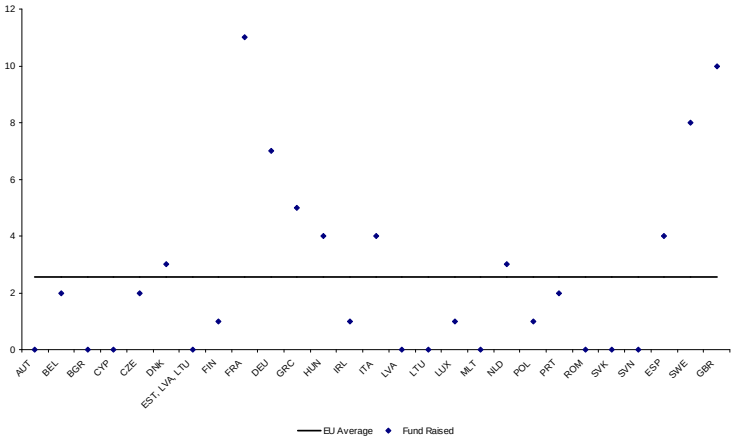
Cash surplus/deficit (% of GDP)



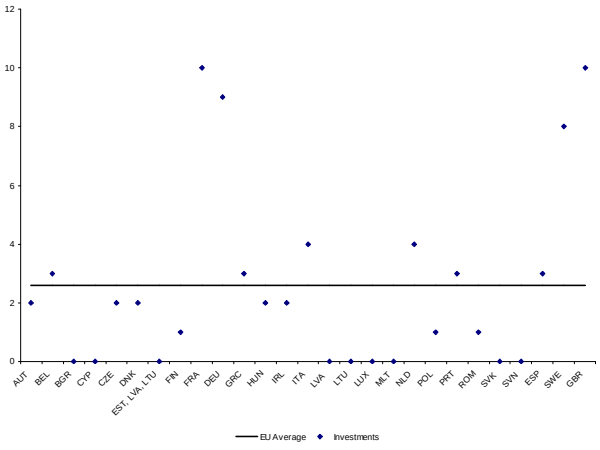
Central government debt, total (% of GDP)



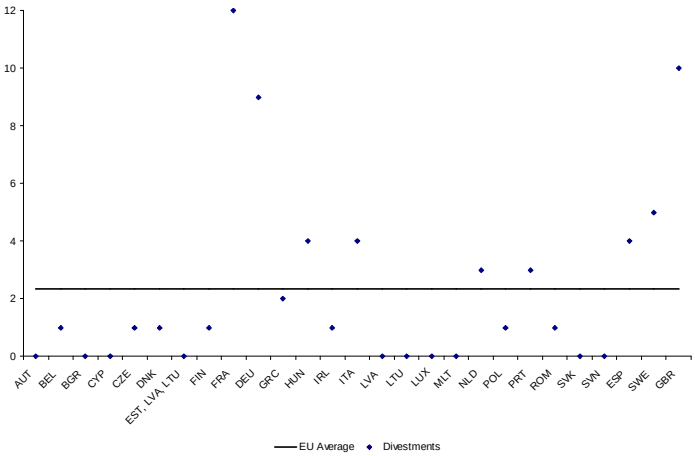
Fund Raised



Investments



Divestments



Source: Author on WDI et al. 2007

*Given that Data for Fund Raising, Investments and Divestments are available only for the years 2006 and 2007, the Y axis reflects the possibility of being above the EU average over a period of 1 or 2 years.

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