

**The Venture Capital and Private Equity
Country Attractiveness Index
2016 Annual**

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Foreword from the Research Team

We are pleased to present the seventh edition of our Venture Capital and Private Equity Country Attractiveness Index. The index measures the attractiveness of countries for investors in the venture capital (VC) and private equity (PE) asset classes. It provides the most up-to-date aggregated information on the quality of the investment environment and an assessment of the ease of transaction-making in 125 countries.

Although we are aware that the stage of development in many of the covered emerging markets is not yet sufficiently mature to support VC or PE transactions, we expect improvements in the future. We have therefore started tracking these emerging economies and our index illustrates the progress of their investment conditions.

As we did in recent years, we prove that our index corresponds with the actual VC and PE investment activity in our sample of countries. This demonstrates the quality of our composite measure and its value to investors. The high explanatory power of our index for the real VC and PE activity results from exclusively focusing on those factors which really shape the attractiveness of particular VC and PE markets, and weighting them reasonably.

In future editions, selected data series may be substituted by newer or more appropriate ones. Additional data could be added, while other series with poor explanatory power can be deleted. As a result our composite measure remains a dynamic research product that always takes into account the most relevant and recent data. We believe this index is unique in providing such a broad scope of information on the VC and PE capital market segment. We hope that investors appreciate the information generated to aid their decision-making; while politicians may utilise the index to benchmark their countries and to make improvements to attract international risk capital.

We are very grateful for the support by our Research Assistants Arnau Gil and Maximilian Rieder. They provided substantial effort to update the data and to compile the new index.

The Research Team

Website

Please visit our website <http://blog.iese.edu/vcpeindex/> where you can download the pdf of this annual, and find additional information, links to literature, multimedia presentations, and analytical tools for country benchmarking purposes.

Contents

About the Editors	4
Research Team	6
How to Measure a Country's Attractiveness for Investors in VC and PE Assets.....	7
Building the 2016 Index	13
The 2016 VC/PE Country Attractiveness Ranking	23
The Regional VC and PE Attractiveness Landscape	25
Historic comparison and allocation recommendations.....	26
The BRICS, Turkey, Mexico, Indonesia, the Philippines, and Nigeria	28
Tracking Power of our Index	31
Our Index and Historic VC and PE Returns.....	33
Summary and Outlook	35
Appendix 1: Computation of the Index	36
Appendix 2: Statistical Validation of the Index.....	39
References.....	40

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How to Measure a Country's Attractiveness for Investors in VC and PE Assets

Without being familiar with the socio-economic environment in various host countries, an investor cannot make rational international VC and PE allocation decisions. Investors overcome potential knowledge deficits and gather data to analyse the determinants they deem important before allocating to a particular country. However, this country due diligence is time-consuming and costly. Additionally, the pace of economic development of many emerging countries makes the selection of those that meanwhile support VC and PE activity more and more cumbersome. Our index guides institutional investors to solve the problem of where to allocate their capital. We aggregate and provide the requisite information for international VC and PE allocation decisions. Of course, this information cannot act as a substitute for investors' own efforts to build up country knowledge and experience. It can only facilitate this process and support the initial due diligence stage.

We propose a composite measure that benchmarks the attractiveness of 125 countries to receive institutional VC and PE allocations. Our intention is to serve the investment community, preparing and analysing a large quantity of socio-economic data. However, it is not only the financial community that can benefit from our research, politicians may also conclude that vibrant risk capital markets increase innovation, entrepreneurial activity, economic growth, employment, competitiveness and wealth and hence they may be interested in increasing the supply of risk capital in their countries.

There is a major shift of focus from "traditional" and mature VC and PE markets towards emerging regions. Emerging countries attract investors by high economic growth opportunities. Nevertheless, as we subsequently discuss, growth opportunities are not the only factor that renders countries attractive for VC and PE investments, and it is these broader conditions that motivate our index. The existence of a prospering VC and PE market infrastructure and investment environment requires many socio-economic and institutional prerequisites. We presume that several emerging countries are not yet sufficiently mature in terms of their socio-economic development to support the VC and PE business model. Too early entrance in those countries does not appear to be a beneficial strategy. However, our index tracks the countries' socio-economic and institutional development and reveals improvements. This allows investors to better observe foreign markets and to recognise good timing for allocations.

What are Institutional Investors' International VC and PE Allocation Criteria?

Our index addresses the first level of investors' concerns from a top-down perspective and evaluates countries with respect to socio-economic criteria for international VC and PE allocation. These criteria assess, in the first instance, the determination of local demand for VC and PE and second, the expectation of an efficient deal-making environment which allows matching with the supplied capital. Further levels of the allocation process include the selection of particular fund management teams. Thereby, the investors evaluate the general partners' competencies, their track records and other parameters in their fund due

diligence before committing to a general partner.¹ However, these criteria cannot be considered in our index because they depend on individual cases, personal judgment and mostly undisclosed data.

Institutional investors communicated to us that levels of valuation are also important for their decisions. Unfortunately, we cannot compare valuation levels across countries for two major reasons. First, there is too little information provided on transaction multiples. Second, multiples reflect the relationship between the expected growth in certain industries (and countries) and the opportunity cost of capital. It is impossible to estimate these parameters and to find a common benchmark for all of our sample countries. Instead, we need to take a practical approach and assess the expected deal opportunities arising from the socio-economic environment in a country without addressing valuation levels. Investors will need to enrich our assessment with their own knowledge and expectations about deal values.

Our index summarises factors that shape national VC and PE markets into one single composite measure. The determinants of vibrant VC and PE markets have been extensively studied in academic literature. We reviewed this literature and collect data for our index spanning several years to verify these studies and actually contribute to a better understanding of the drivers of international VC and PE activity. With every subsequent index edition, we become more confident in our ability to assess the right criteria for VC and PE investors. These criteria are derived from the research on the topic that we group into six sub-headings. These sub-headings illustrate the structure of our index as each presents one of six “key drivers” of country attractiveness for investors in VC and PE assets:

1. Economic Activity,
2. Depth of Capital Market,
3. Taxation,
4. Investor Protection & Corporate Governance,
5. Human & Social Environment, and
6. Entrepreneurial Culture & Deal Opportunities.

These key drivers define a subset of criteria we need to assess for our sample countries in order to aggregate our index.²

Importance of Economic Activity

Evidently, the state of a country’s economy affects its VC/PE attractiveness. An economy’s size and employment levels are proxies for prosperity, the number and diversity of corporations and general entrepreneurial activity, and therefore also for expected VC and PE deal flow. Economic growth expectations require investments and provide the rationale to enter many emerging countries. Gompers and Lerner (1998) argue that more attractive VC and PE investment opportunities exist if an economy is growing quickly. Romain and van Pottelsberghe de la Potterie (2004) find that VC/PE activity is cyclical and significantly

¹ For more details please refer to Groh, Alexander and Liechtenstein, Heinrich (2011): The First Step of the Capital Flow from Institutions to Entrepreneurs: The Criteria for Sorting Venture Capital Funds, European Journal of Financial Management, Vol. 17, Issue 3, 2011, pp. 532-559. Related working papers are available on <http://blog.iese.edu/vcpeindex/>.

² For a comprehensive review please refer to Groh, Alexander, Liechtenstein, Heinrich and Lieser, Karsten (2010): The European Venture Capital and Private Equity Country Attractiveness Indices, Journal of Corporate Finance, Volume 16, Issue 2, April 2010, pp. 205 – 224.

related to GDP growth. Wilken (1979) highlights the fact that economic prosperity and development facilitate entrepreneurship, as they provide a greater accumulation of capital for risky investments. The number of new ventures that qualify for VC backing is related to societal wealth, not solely because of generally better access to financing, but also because of higher income among potential customers in the domestic market. Economic size and growth are certainly very important criteria to assess expected deal opportunities and VC/PE country attractiveness. However, economic growth itself is also a result of many other criteria which we discuss within the subsequent key drivers.

Importance of Depth of Capital Market

Black and Gilson (1998) discuss major differences between bank-centred and stock market-centred capital markets. They argue that well-developed stock markets, which allow general partners to exit via IPOs, are crucial for the establishment of vibrant VC/PE markets. In general, bank-centred capital markets are less able to produce an efficient infrastructure of institutions that support VC/PE deal-making. They affirm that it is not only the strong stock market that is missing in bank-centred capital markets; it is also the secondary institutions in place, including bankers' conservative approach to lending and investing, and the social and financial incentives that reward entrepreneurs less richly (and penalise failure more severely), that compromise entrepreneurial activity. Jeng and Wells (2000) stress that IPO activity is the main force behind cyclical VC and PE swings because it directly reflects the returns to investors. Kaplan and Schoar (2005) confirm this. Similar to Black and Gilson (1998), Gompers and Lerner (2000) point out that risk capital flourishes in countries with deep and liquid stock markets. Similarly, Schertler (2003) uses the capitalisation of stock markets or the number of listed companies as measures for stock market liquidity and finds that they significantly impact VC and PE investments.

As well as the disadvantages of bank-centred capital markets, Greene (1998) emphasizes that low availability of debt financing is an obstacle for economic development, especially for start-up activity in many countries. Corporations and entrepreneurs need to find backers — whether banks or VC/PE funds — who are willing to bear risk. Cetorelli and Gambera (2001) provide evidence that bank concentration promotes the growth of those industrial sectors that have a higher need for external finance by facilitating credit access to companies.

To summarise, the state of a country's capital market evidently affects its VC and PE activity. There is a direct link between the quoted capital market, banking activity and the unquoted segment. Banks are required for transaction financing and credit facilities. The size of the IPO market indicates the potential for the preferred exit channel and IPOs likewise spur entrepreneurial spirit because they reward entrepreneurs. This may be considered as analogous to the size of the M&A market, which also incentivises entrepreneurial managers and presents the second preferred VC/PE divestment channel, as well as deal sourcing opportunities. Therefore, the liquidities of the M&A, banking, and public capital markets provide good proxies for the VC and PE segment because they assess the quality of the VC and PE deal-making infrastructure. In countries with a strong public capital market, M&A, and banking activity, we also find the professional institutions, such as investment banks, accountants, lawyers, M&A boutiques or consultants, which are essential for successful VC and PE deal-making.

Importance of Taxation

Bruce (2000 and 2002), and Cullen and Gordon (2002) reveal that tax regimes matter for business entry and exit. Djankov *et al.* (2008) show that direct and indirect taxes affect entrepreneurial activity. Poterba (1989) builds a decision model showing the advantages of becoming an entrepreneur, driven by taxation incentives. Bruce and Gurley (2005) explain that increases in personal income tax can raise the probability of becoming an entrepreneur: large differences between personal income tax rates and corporate tax rates provide an incentive for start-up activity.

While it is much discussed in economic literature and reasonable to predict that taxation of income drives corporate activity and new venture creation, it is more difficult to detect a direct link with VC and PE investments. There are countries with relatively high corporate income tax rates but also very large VC and PE investments at the same time. On the other hand, there are many (especially emerging) countries with low corporate tax rates where no remarkable VC and PE investments are reported. In general, developed countries have higher tax brackets, but also more VC and PE investments. This signals that the levels of taxes themselves do not strongly affect VC and PE activity. It also points to the characteristic reliance of the VC and PE asset classes on tax transparent fund and transaction structures that neutralise the differentials across tax regimes. Therefore, we focus on the incentives for new venture creation provided by the spread between personal and corporate income tax rates as suggested by Bruce and Gurley (2005) and reward tax regimes with low administrative burdens and requirements in our index. However, since these tax aspects are more important for start-up activity, and hence for the VC segment, we assign a low weight to this key driver and do not use it to assess attractiveness in the PE-only index as subsequently discussed.

Importance of Investor Protection & Corporate Governance

Legal structures and the protection of property rights strongly influence the attractiveness of VC and PE markets. La Porta *et al.* (1997 and 1998) confirm that the legal environment determines the size and extent of a country's capital market and local companies' ability to receive outside financing. They emphasize the differences between statutory law and the quality of law enforcement. Roe (2006) discusses and compares the political determinants of corporate governance legislation for the major economies and focuses on the importance of strong shareholder protection to develop a vibrant capital market. Glaeser *et al.* (2001) and Djankov *et al.* (2003 and 2005) suggest that parties in common-law countries have greater ease in enforcing their rights from commercial contracts.

Cumming *et al.* (2006) find that the quality of a country's legal system is even more closely related to facilitating VC/PE backed exits than the size of a country's stock market. Cumming *et al.* (2009) extend this finding and show that cross-country differences in legality, including legal origin and accounting standards, have a significant impact on the governance of investments in the VC/PE industry. Desai *et al.* (2006) show, that fairness and property rights protection largely affect growth and the emergence of new enterprises. Cumming and Johan (2007) highlight the perceived importance of regulatory harmonisation with respect to investors' commitments to the asset class. La Porta *et al.* (2002) find a lower cost of capital for companies in countries with better investor protection, and Lerner and Schoar (2005) confirm these findings. Johnson *et al.* (1999) show that weak property rights limit the reinvestment of profits in start-up companies. Finally, and more broadly, Knack and Keefer (1995), Mauro (1995), and Svensson (1998) demonstrate that property rights significantly impact investments and economic growth.

The numerous studies cited above illustrate the importance of the quality of a country's legal system for its capital market, be it in terms of the quoted or unquoted segment. Nevertheless, what is important for financial claims is equally valid for any claim in the corporate world. Doing business becomes costly without proper legal protection and enforcement possibilities. VC and PE are strongly exposed to this circumstance because they are based on long-term relationships with institutional investors, where the investment source and host countries can be distant and different. Investors rely on their agents, and the general partners themselves rely on the management teams they back. If investors are not confident that their claims are well protected in a particular country, they refuse to allocate capital.

Importance of Human & Social Environment

Black and Gilson (1998), Lee and Peterson (2000), and Baughn and Neupert (2003) argue that cultures shape both individual orientation and environmental conditions, which may lead to different levels of entrepreneurial activity. Megginson (2004) argues that, in order to foster a growing risk capital industry, education with respect to schools, universities and research institutions plays an important role.

Rigid labour market policies negatively affect the evolution of a VC/PE market. Lazear (1990) and Blanchard (1997) discuss how protection of workers can reduce employment and growth. It is especially important for start-up and medium-size corporations to respond quickly to changing market conditions. Black and Gilson (1998) argue that labour market restrictions influence VC/PE activity, though not to the same extent as the stock market.

Djankov *et al.* (2002) investigate the role of several societal burdens for start-ups. They conclude that the highest barriers and costs are associated with corruption, crime, a larger unofficial economy and bureaucratic delay. This argument is of particular importance in some emerging countries with high perceived levels of corruption.

Importance of Entrepreneurial Culture & Deal Opportunities

The expectation regarding access to viable investments is probably the most important factor for international risk capital allocation decisions. Particularly for the early stage segment, we expect the number and volume of investments to be related to the innovation capacity and research output in an economy. Gompers and Lerner (1998) show that both industrial and academic research and development (R&D) expenditure significantly correlates with VC activity. Kortum and Lerner (2000) highlight that the growth in VC fundraising in the mid-1990s may have been due to a surge of patents in the late 1980s and 1990s. Schertler (2003) emphasizes that the number of both R&D employees and patents, as an approximation of the human capital endowment, has a positive and highly significant influence on VC activity. Furthermore, Romain and von Pottelsberghe de la Potterie (2004) find that start-up activity interacts with the R&D capital stock, technological opportunities and the number of patents. However, innovations and R&D are not only important for early stage VC investments. Without modernisation and sufficient R&D, it will be impossible for established businesses to maintain brand names and strong market positions, factors which attract later stage PE investors.

Despite the innovative output of a society, Djankov *et al.* (2002), and Baughn and Neupert (2003) argue that bureaucracy in the form of excessive rules and procedural requirements, multiple institutions from which approvals are needed and cumbersome documentation requirements, may severely constrain

entrepreneurial activity. Lee and Peterson (2000) stress that the time and money required to meet such administrative burdens may discourage new venture creations.

Summary on the Determinants of Vibrant VC and PE Markets

The research papers emphasise the difficulty of identifying the most appropriate parameters for our index. There is no consensus about a ranking of the criteria. While some parameters are more comprehensively discussed, and certainly of high relevance, it remains unclear how they interact with others. For example, it is arguable whether the VC/PE activity in a country with a high quality of investor protection is affected more by the liquidity of its stock market or by its labour regulations.

While an IPO exit is, in principle, possible at any stock exchange in the world, the labour market frictions in a particular country can hardly be evaded. On the other hand, many of the criteria are highly correlated with each other. Black and Gilson (1998) call it a “chicken and egg” problem: it is impossible to detect which factor causes the other. One line of argument is that modern, open and educated societies develop a legislation that protects investors’ claims, which favours the output of innovation and the development of a capital market. This leads to economic growth and to demand for VC and PE. However, the causality might be the reverse: economic growth spurs innovation and the development of modern educated societies. There is a third suggestion: only competitive legal environments allow the development of the societal requirements that support innovations, economic growth, the capital market, and VC and PE activity. Finally, there is a fourth alternative, which may also be relevant: low taxes attract investors who provide financing for growth which in turn leads to modern and educated societies.

All lines of argument are reasonable and validated by the economic development of selected countries in different historic periods. Nevertheless, it seems to be the combination of all these factors which need to be improved in parallel to increase VC and PE attractiveness of countries and regions. For this reason, we do not rely on a selection of only a small number of parameters. For a country to receive a high index rank, it needs to achieve a high score on all of the individual criteria. Therefore, we propose a structure of the discussed determinants to achieve a comprehensive result and to facilitate interpretation. Firstly, we differentiate the six key drivers: economic activity, depth of the capital market, taxation, investor protection and corporate governance, human and social environment, and entrepreneurial culture and deal opportunities. We then confirm their choice via a survey of institutional investors, reported in Groh and Liechtenstein (2009) and (2011), and base our index structure upon them. Unfortunately, none of these six key drivers is directly measurable, so we seek data series that adequately express their character. Hence, we try to find best proxies for the aforementioned drivers of VC/PE attractiveness. One constraint is that these proxies must be available for a large number of countries.

Building the 2016 Index

Assessing Six Latent Key Drivers

The most important principle of our index is to assess the six latent drivers of VC/PE attractiveness:

1. Economic Activity,
2. Depth of Capital Market,
3. Taxation,
4. Investor Protection & Corporate Governance,
5. Human & Social Environment, and
6. Entrepreneurial Culture & Deal Opportunities.

Latent drivers are criteria that are not directly observable, but driven by others which can be measured. For example, we assume in a first step that the VC/PE attractiveness of a country is determined by six key drivers. Nevertheless, as pointed out, the key drivers themselves are not measurable but need to be estimated. For example, ideally the quality of the deal-making environment in a country would be expressed by the number of investment banks, M&A boutiques, law firms, accountants and consultants. Unfortunately, while it might be possible to obtain these data for a selected number of developed countries, such data does not exist on a global scale. Our only alternative is to gather more general information, for example on the level of debt provided by the banking sector, or estimates about the perceived sophistication of the financial system. We submit that these criteria affect the latent key driver, the depth of the capital market. Even if they are not perfect proxies, we maintain that in countries where these criteria are better developed, the capital market will be deeper and more deal-supporting institutions will exist to facilitate VC and PE activity. Hence, we assess the latent key driver with observable data. This principle is maintained at all individual levels for the index construction. An unobservable criterion is assessed with several proxy parameters. In principle, we measure the attractiveness of a country by the six key drivers but use many more proxies for their assessment. We always use several proxies so as not to be reliant on single individual data series which might be biased by different gathering procedures across the countries or by insufficient reporting.

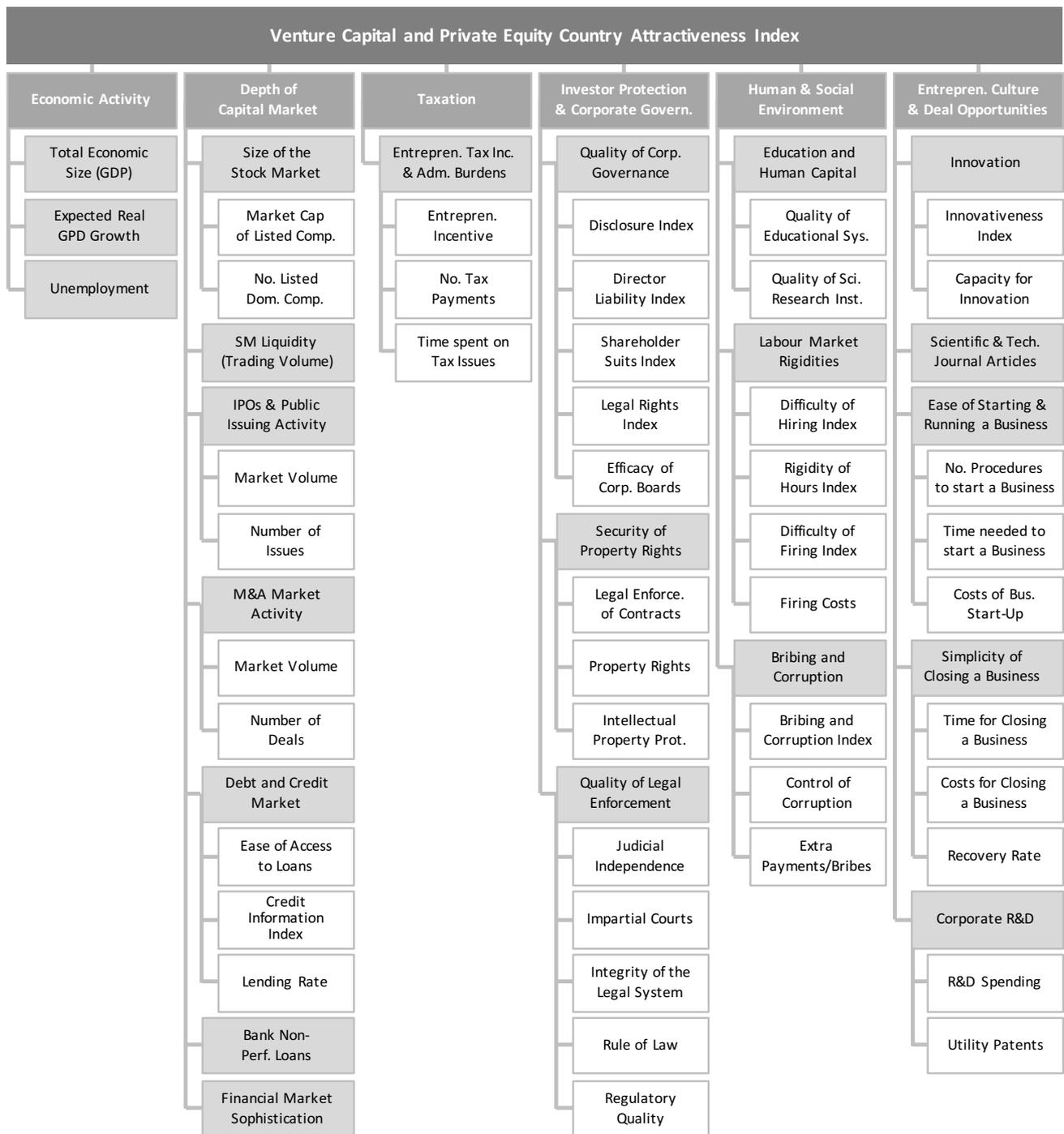


Exhibit 1: VC/PE Country Attractiveness Index – construction scheme

How We Disaggregate the Six Key Drivers

In accordance with the principle of assessing latent key drivers with observable data, we disaggregate each key driver into sub-categories. These sub-categories are either individual data series or, again, latent drivers dependent on determinants that we name “level-2 constructs.” For example, as documented in Exhibit 1, we split the key driver “2. Depth of the capital market” into seven sub-categories:

2. Depth of Capital Market:
 - 2.1. Size of the Stock Market,
 - 2.2. Stock Market Liquidity (Trading Volume),
 - 2.3. IPOs & Public Issuing Activity,
 - 2.4. M&A Market Activity,
 - 2.5. Debt & Credit Market,
 - 2.6. Bank Non-Performing Loans to Total Gross Loans, and
 - 2.7. Financial Market Sophistication.

Data series 2.2 and 2.6 are provided by the World Bank and data series 2.7 results from a survey initiated by the World Economic Forum (WEF). However, the other indicators are constructs themselves. For instance, we assess “2.3 IPOs & Public Issuing Activity” by volume and by number of issues. This approach has two major advantages. First, individual data series do not gain too much weight when they are grouped, and this limits the impact of outliers. Second, the overall results can be traced to more granulated levels which provide complete transparency and better interpretation.

The Weighting Scheme

We spent a great deal of effort refining the statistical analyses and optimising the structure for our first two index editions.³ We keep this optimised structure and apply equal weights for all data series when we aggregate them to the level-2 constructs and equal weights for the level-2 constructs to aggregate them on the next higher level of the six key drivers. Finally, the individual weights for the six key drivers depend on the number of their level-2 constructs. For example, “1. Economic Activity” consists of three level-2 constructs, “2. Depth of Capital Market” of seven, while “3. Taxation” consists of only one. Overall, we use 22 level-2 constructs for our index, and hence, “1. Economic Activity” receives a weight of $3/22$, which is 0.136, while the weight of “2. Depth of Capital Market” is $7/22$, which is 0.318, and for “3. Taxation” it is $1/22 = 0.046$, respectively.

The advantage of this weighting scheme is that the key drivers which include more level-2 constructs, and hence data series, gain more weight. First, this represents their actual importance for VC and PE attractiveness as revealed by our own analyses and second, we diminish the effect of potential outliers in our data. This final index structure results from substantial prior optimisation effort. We find that any statistically “more sophisticated” technique does not improve the index quality. The weighting scheme

³ Details about the applied statistical procedures to determine weights for the data series are provided in our paper Groh, Alexander, Liechtenstein, Heinrich and Lieser, Karsten (2010): The European Venture Capital and Private Equity Country Attractiveness Indices, Journal of Corporate Finance, Volume 16, Issue 2, April 2010, pp. 205 – 224. Related working papers are available at <http://ssrn.com/author=330804>.

assigns appropriate emphasis according to the explanatory power of the individual key drivers. We will return to this topic in a later section of this annual.

Separate VC and PE Indices

To account for differences with respect to the two market segments, VC vs. PE, we propose three related indices. The first one combines both segments (VC/PE). The second focuses on early stage VC only and the third index on later stage PE. The combined index includes all data series proposed in Table 1, while we discard the data series that are less important for either of the two market segments when calculating the individual VC and PE indices.

For the VC index, we consider the level-2 construct “2.5 Debt & Credit Market” to be of minor importance and hence, discard it. We also delete “2.6 Bank Non-Performing Loans to Total Gross Loans” and “2.7 Financial Market Sophistication” from the VC index.

For the PE index, we discard key driver “3. Taxation,” because the criteria considered are barely relevant for later-stage PE. Similarly, we drop “5.1 Education & Human Capital” from the human and social environment key driver and keep only “6.5 Corporate R&D” to assess the deal opportunities related to proprietary research output of corporations.

The weights for the individual index items in the separate VC and PE indices are determined in the same way, and this leads to changes of some of the key driver weights. The results are highlighted on the individual country pages subsequent in this annual.

Table 1 shows the data series, the level-2 constructs and the weights for the combined VC/PE, and the separate VC-only and PE-only indices. The weights are presented with respect to the next aggregation level. Hence, “1.1 Size of the Economy”, “1.2 Expected Real GDP Growth” and “1.3 Unemployment” receive each a weight of 33.3% when determining the Economic Activity key driver. The key driver itself has an importance of 13.6% for the aggregation of the overall VC/PE index. We provide more information about the aggregation technique in the appendix.

ID	Construct	Dimension	VC/PE Index Weight	VC-only Index Weight	PE-only Index Weight
0	VCPE Index 2016		100.0%	100.0%	100.0%
1	Economic Activity		13.6%	15.8%	18.8%
1.1	Size of the Economy (GDP) Source: Euromonitor International, National statistics/Eurostat/OECD/UN/International Monetary Fund (IMF), International Financial Statistics (IFS)	LN US\$ mn	33.3%	33.3%	33.3%
1.2	Expected Real GDP Growth Source: Euromonitor International, National statistics/Eurostat/OECD/UN/International Monetary Fund (IMF), World Economic Outlook (WEO)	%	33.3%	33.3%	33.3%
1.3	Unemployment Source: Euromonitor International, International Labour Organisation (ILO)/Eurostat/national statistics/OECD	%	33.3%	33.3%	33.3%
2	Depth of Capital Market		31.8%	21.1%	43.8%
2.1	Size of the Stock Market		14.3%	25.0%	14.3%
2.1.1	Market Capitalization of Listed Companies Source: World Bank, World Development Indicators; World Federation of Exchanges database	% of GDP	50.0%	50.0%	50.0%
2.1.2	Number of Listed Domestic Companies Source: World Bank, World Development Indicators; World Federation of Exchanges database	LN number	50.0%	50.0%	50.0%
2.2	Stock Market Liquidity (Trading Volume) Source: World Bank, World Development Indicators; World Federation of Exchanges database	% of GDP	14.3%	25.0%	14.3%
2.3	IPOs & Public Issuing Activity		14.3%	25.0%	14.3%
2.3.1	Market Volume Source: Thomson One Banker, SDC Platinum Global New Issues	LN US\$ mn	50.0%	50.0%	50.0%
2.3.2	Number of Issues Source: Thomson One Banker, SDC Platinum Global New Issues	LN number	50.0%	50.0%	50.0%
2.4	M&A Market Activity		14.3%	25.0%	14.3%
2.4.1	Market Volume Source: Thomson One Banker, SDC Platinum Mergers & Acquisitions	LN US\$ mn	50.0%	50.0%	50.0%

ID	Construct	Dimension	VC/PE Index Weight	VC-only Index Weight	PE-only Index Weight
2.4.2	Number of Deals Source: Thomson One Banker, SDC Platinum Mergers & Acquisitions	LN number	50.0%	50.0%	50.0%
2.5	Debt & Credit Market		14.3%		14.3%
2.5.1	Ease of Access to Loans Source: World Economic Forum, Global Competitiveness Report; World Economic Forum, Executive Opinion Survey	% of GDP	33.3%		33.3%
2.5.2	Credit Information Index Source: World Bank, Doing Business		33.3%		33.3%
2.5.3	Lending Rate Source: Euromonitor International from International Monetary Fund (IMF), International Financial Statistics and national statistics/OECD	%	33.3%		33.3%
2.6	Bank Non-Performing Loans to Total Gross Loans Source: World Bank, World Development Indicators; International Monetary Fund, Global Financial Stability Report	%	14.3%		14.3%
2.7	Financial Market Sophistication Source: World Economic Forum, Global Competitiveness Report; World Economic Forum, Executive Opinion Survey		14.3%		14.3%
3	Taxation		4.5%	5.3%	
3.1	Entrepreneurial Tax Incentives & Administrative Burdens		100.0%	100.0%	
3.1.1	Entrepreneurship Incentive Source: KPMG, Corporate Tax and Personal Income Tax Tables	%	33.3%	33.3%	
3.1.2	Number of Tax Payments Source: World Bank, Doing Business		33.3%	33.3%	
3.1.3	Time spent on Tax Issues Source: World Bank, Doing Business	Hours per year	33.3%	33.3%	
4	Investor Protection & Corporate Governance		13.6%	15.8%	18.8%
4.1	Quality of Corporate Governance		33.3%	33.3%	33.3%
4.1.1	Disclosure Index Source: World Bank, Doing Business		20.0%	20.0%	20.0%
4.1.2	Director Liability Index Source: World Bank, Doing Business		20.0%	20.0%	20.0%

ID	Construct	Dimension	VC/PE Index Weight	VC-only Index Weight	PE-only Index Weight
4.1.3	Shareholder Suits Index Source: World Bank, Doing Business		20.0%	20.0%	20.0%
4.1.4	Legal Rights Index Source: World Bank, Doing Business		20.0%	20.0%	20.0%
4.1.5	Efficacy of Corporate Boards Source: World Economic Forum, Global Competitiveness Report; World Economic Forum, Executive Opinion Survey		20.0%	20.0%	20.0%
4.2	Security of Property Rights		33.3%	33.3%	33.3%
4.2.1	Legal Enforcement of Contracts Source: Fraser Institute, Economic Freedom of the World; World Bank, Doing Business		33.3%	33.3%	33.3%
4.2.2	Property Rights Source: World Economic Forum, Global Competitiveness Report; World Economic Forum, Executive Opinion Survey		33.3%	33.3%	33.3%
4.2.3	Intellectual Property Protection Source: World Economic Forum, Global Competitiveness Report; World Economic Forum, Executive Opinion Survey		33.3%	33.3%	33.3%
4.3	Quality of Legal Enforcement		33.3%	33.3%	33.3%
4.3.1	Judicial Independence Source: World Economic Forum, Global Competitiveness Report; World Economic Forum, Executive Opinion Survey		20.0%	20.0%	20.0%
4.3.2	Impartial Courts Source: World Economic Forum, Global Competitiveness Report; World Economic Forum, Executive Opinion Survey		20.0%	20.0%	20.0%
4.3.3	Integrity of the Legal System Source: Fraser Institute, Economic Freedom of the World; PRS Group, International Country Risk Guide		20.0%	20.0%	20.0%
4.3.4	Rule of Law Source: World Bank, Worldwide Governance Indicator		20.0%	20.0%	20.0%
4.3.5	Regulatory Quality Source: World Bank, Worldwide Governance Indicator		20.0%	20.0%	20.0%
5	Human & Social Environment		13.6%	15.8%	12.5%
5.1	Education & Human Capital		33.3%	33.3%	0.0%
5.1.1	Quality of the Educational System Source: World Economic Forum, Global Competitiveness Report; World Economic Forum, Executive Opinion Survey		50.0%	50.0%	0.0%

ID	Construct	Dimension	VC/PE Index Weight	VC-only Index Weight	PE-only Index Weight
5.1.2	Quality of Scientific Research Institutions Source: World Economic Forum, Global Competitiveness Report; World Economic Forum, Executive Opinion Survey		50.0%	50.0%	0.0%
5.2	Labour Market Rigidities		33.3%	33.3%	50.0%
5.2.1	Difficulty of Hiring Index Source: World Bank, Doing Business, Labor Market Regulation		25.0%	25.0%	25.0%
5.2.2	Rigidity of Hours Index Source: World Bank, Doing Business, Labor Market Regulation		25.0%	25.0%	25.0%
5.2.3	Difficulty of Firing Index Source: World Bank, Doing Business, Labor Market Regulation		25.0%	25.0%	25.0%
5.2.4	Firing Costs Source: World Bank, Doing Business, Labor Market Regulation	Weeks of wages	25.0%	25.0%	25.0%
5.3	Bribing and Corruption		33.3%	33.3%	50.0%
5.3.1	Corruption Perception Index Source: Transparency International		33.3%	33.3%	33.3%
5.3.2	Control of Corruption Source: World Bank, Worldwide Governance Indicator		33.3%	33.3%	33.3%
5.3.3	Extra Payments/Bribes Source: World Economic Forum, Global Competitiveness Report; World Economic Forum, Executive Opinion Survey		33.3%	33.3%	33.3%
6	Entrepreneurial Culture & Deal Opportunities		22.7%	26.3%	6.3%
6.1	Innovation		20.0%	20.0%	
6.1.1	Global Innovation Index Source: INSEAD, WIPO, Johnson Cornell University		50.0%	50.0%	
6.1.2	Capacity for Innovation Source: World Economic Forum, Global Competitiveness Report; World Economic Forum, Executive Opinion Survey		50.0%	50.0%	
6.2	Scientific and Technical Journal Articles Source: Elsevier, Scopus	LN number	20.0%	20.0%	
6.3	Ease of Starting & Running a Business		20.0%	20.0%	

ID	Construct	Dimension	VC/PE Index Weight	VC-only Index Weight	PE-only Index Weight
6.3.1	Number of Procedures to Start of Business Source: World Bank, Doing Business		33.3%	33.3%	
6.3.2	Time Needed to Start a Business Source: World Bank, Doing Business	Days	33.3%	33.3%	
6.3.3	Costs of Business Start-Up Procedures Source: World Bank, Doing Business	% of income per capita	33.3%	33.3%	
6.4	Simplicity of Closing a Business		20.0%	20.0%	
6.4.1	Time for Closing a Business Source: World Bank, Doing Business	Years	33.3%	33.3%	
6.4.2	Costs for Closing a Business Source: World Bank, Doing Business	% of estate	33.3%	33.3%	
6.4.3	Recovery Rate Source: World Bank, Doing Business	Cents on US\$	33.3%	33.3%	
6.5	Corporate R&D		20.0%	20.0%	100.0%
6.5.1	Company Spending on R&D Source: World Economic Forum, Global Competitiveness Report; World Economic Forum, Executive Opinion Survey		50.0%	50.0%	50.0%
6.5.2	Utility Patents Source: Euromonitor International, Trade sources/national statistics	LN Number	50.0%	50.0%	50.0%

Table 1: structure of the VC/PE index, the separate VC and PE indices, and the weighting schemes

Changes With Respect to the Prior Index Version

The index structure remained unchanged compared to the previous editions. However, we needed to aggregate the Doing Business Indices referring to the labour market rigidities by ourselves. The World Bank has changed their policy and now publishes the sub-indicators instead of providing the aggregated index values. We replaced the raw data series for our stock market indicators 2.1 and 2.2 by data from the World Federation of Exchanges database as Standard & Poor's discontinued to publish their Global Stock Markets Factbook. We further replaced our interest rate spread indicator 2.5.3 by lending rates. Our VC/PE Country Attractiveness Index now consists of 65 individual data series.⁴

Country Coverage

We aim to cover as many countries as possible, and the inclusion of a particular country is dependent only on data availability. Since our first index edition, the availability and quality of data has continuously improved so that we can now include 125 countries, compared to 120 of last year's edition. We added Azerbaijan, Bolivia, Lebanon, Qatar and Sri Lanka. We assign the countries to eight different geographic regions as defined by the International Monetary Fund.

Region (Number of Countries Covered)	Countries
Africa (31)	Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Chad, Côte d'Ivoire, Egypt, Ethiopia, Ghana, Kenya, Lesotho, Madagascar, Malawi, Mali, Mauritania, Mauritius, Morocco, Mozambique, Namibia, Nigeria, Rwanda, Senegal, South Africa, Tanzania, Tunisia, Uganda, Zambia, Zimbabwe
Asia (22)	Armenia, Azerbaijan, Bangladesh, Cambodia, China, Hong Kong, India, Indonesia, Japan, Kazakhstan, Korea South, Kyrgyzstan, Malaysia, Mongolia, Pakistan, Philippines, Russia, Singapore, Sri Lanka, Taiwan, Thailand, Vietnam
Australasia (2)	Australia, New Zealand
Eastern Europe (21)	Albania, Belarus, Bosnia-Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Georgia, Hungary, Latvia, Lithuania, Macedonia, Moldova, Montenegro, Poland, Romania, Slovakia, Slovenia, Turkey, Ukraine, Serbia
Latin America (17)	Argentina, Bolivia, Brazil, Chile, Colombia, Dominican Republic, Ecuador, El Salvador Guatemala, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Uruguay, Venezuela
Middle East (10)	Bahrain, Israel, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Syria, United Arab Emirates
North America (2)	United States, Canada
Western Europe (20)	Austria, Belgium, Cyprus, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom

⁴ Without counting the numerous data series to assess sub-indicator 5.2 Labour Market Rigidities.

The 2016 VC/PE Country Attractiveness Ranking

We gathered the individual data series in Table 1 for all our sample countries from 2000 onwards to most recent data retrieved. We calculated the 2016 outlook and found that the US remains the most attractive country for VC and PE allocations, retaining its ranking from all previous index editions. We rescaled the US score to 100.⁵ Its two followers, the United Kingdom and Canada, achieved rescaled scores of 95.5% and 94.3% respectively. We note that the gaps between these and other countries have narrowed compared to prior index editions. This is mainly due to the inclusion of additional economies in our sample which has widened the spread between the leading and trailing countries. It is also due to the principle that the characteristics of a growing number of countries need to be ranked on the same scale from 1 to 100.

Table 2 presents the ranking of *The VC and PE Country Attractiveness Index 2016*. The table is open to debate. Some readers might argue that particular countries are ranked too high, others too low. However, we note that the index ranking is the result of commonly available, transparent, aggregated socio-economic data, which describes relevant characteristics for investors in VC and PE assets. The results can be traced to the level of the individual data series, and hence, can be reconciled. We are aware that there are several countries, e.g. among the BRICS or other emerging markets which currently receive strong investor attention and record levels of VC and PE activity. One could criticize our index ranking which hardly reflects this trend. It is certain that the capital absorption capacity in many emerging markets allows quick transaction making and large volumes. We could be attempted to increase the weight of GDP growth or of the economic activity key driver to reflect investors' appreciation of these fast growing markets. However, we note that our weights are an optimized result of comprehensive cross sectional and longitudinal analyses (as we show subsequently). Increasing the weight of GDP growth, for example, can produce awkward rankings which do not correspond with the fact that many of the "traditional" markets still provide the best deal making, value adding, and exit opportunities for VC and PE investors. It is not evident from today's perspective that the shift of investors' attention towards emerging countries will result in increased levels of successful transactions on the long run, and hence, satisfying returns to investors in the future. Our index assesses a "probability for success" from the institutional and socio-economic perspective. This probability increases with better developed key driving forces as we defined them above, and vice versa.

Please note that the underlying data is the most recent information available. Hence, we show the current attractiveness ranking including the economic outlook for 2016 and invite investors and advisers to enrich the information with their own knowledge, experience and expectations when drawing their conclusions on allocation.

⁵ We explain the rescaling procedure in more detail in the appendix.

Country	Rank/Trend	Score	Country	Rank/Trend	Score	Country	Rank/Trend	Score
United States	1 -	100.0	Iceland	43 ↓	63.2	Uganda	85 ↑	42.8
United Kingdom	2 ↑	95.5	Estonia	44 ↑	62.6	Pakistan	86 ↓	42.6
Canada	3 ↓	94.3	Mauritius	45 ↑	62.4	Nigeria	87 ↓	41.8
Singapore	4 -	93.3	Romania	46 ↑	61.0	Tanzania	88 ↓	41.2
Hong Kong	5 ↑	92.7	Hungary	47 ↓	60.1	Ghana	89 ↑	40.2
Australia	6 ↓	91.9	Vietnam	48 -	59.5	Kyrgyzstan	90 ↑	40.1
Japan	7 -	91.8	Kazakhstan	49 ↑	59.4	El Salvador	91 -	38.4
New Zealand	8 ↑	88.7	Slovenia	50 ↑	59.1	Kenya	92 ↑	38.2
Germany	9 ↓	88.6	Bahrain	51 ↓	58.8	Namibia	93 ↓	36.7
Switzerland	10 ↑	85.7	Latvia	52 ↑	58.7	Bangladesh	94 ↓	36.0
Malaysia	11 ↑	85.6	Peru	53 ↓	58.7	Belarus	95 -	33.7
Denmark	12 ↓	85.4	Brazil	54 ↓	58.3	Malawi	96 ↓	33.4
Norway	13 ↑	85.2	Bulgaria	55 ↑	58.0	Ivory Coast	97 ↑	33.1
Finland	14 -	85.2	Czech Republic	56 ↑	57.6	Bosnia-Herzegovina	98 ↓	32.9
Sweden	15 ↓	84.6	Sri Lanka	57 ↓	56.4	Dominican Republic	99 ↑	32.3
Netherlands	16 -	84.4	Morocco	58 ↓	55.8	Rwanda	100 ↑	32.0
Ireland	17 ↑	82.2	Jordan	59 ↑	54.8	Bolivia	101 ↓	31.8
Belgium	18 ↓	81.6	Oman	60 ↓	54.3	Moldova	102 ↓	31.7
Israel	19 ↓	81.3	Slovakia	61 ↑	54.2	Guatemala	103 ↓	31.5
Korea, South	20 ↑	80.8	Argentina	62 ↓	54.0	Azerbaijan	104 ↑	29.1
France	21 ↓	80.3	Georgia	63 ↑	53.8	Cambodia	105 ↑	29.0
Taiwan	22 ↓	79.4	Zambia	64 ↑	53.3	Paraguay	106 ↓	28.3
Austria	23 ↓	78.5	Tunisia	65 ↓	53.2	Albania	107 ↓	26.4
China	24 ↓	77.1	Greece	66 ↑	53.2	Algeria	108 ↑	26.0
Poland	25 ↑	73.7	Cyprus	67 ↓	52.7	Cameroon	109 ↑	25.0
Spain	26 -	73.7	Qatar	68 ↓	50.1	Ethiopia	110 ↑	24.7
Chile	27 ↓	73.0	Malta	69 ↓	50.0	Nicaragua	111 ↓	24.6
Thailand	28 ↑	71.5	Egypt	70 ↓	50.0	Senegal	112 ↓	24.1
India	29 -	69.9	Ukraine	71 ↑	50.0	Madagascar	113 ↑	24.0
Luxembourg	30 ↑	68.9	Mongolia	72 ↑	49.1	Mali	114 ↓	23.7
Portugal	31 ↑	68.6	Macedonia	73 ↑	47.5	Mozambique	115 ↓	23.4
South Africa	32 ↓	67.5	Ecuador	74 ↑	47.3	Lesotho	116 ↑	22.4
Turkey	33 ↑	67.2	Armenia	75 ↑	47.2	Zimbabwe	117 ↓	22.3
Italy	34 ↓	67.0	Uruguay	76 ↓	46.9	Burkina Faso	118 ↓	20.7
Saudi Arabia	35 ↓	66.8	Serbia	77 ↑	46.1	Benin	119 ↓	20.5
Colombia	36 ↓	66.3	Panama	78 ↑	46.1	Venezuela	120 ↓	19.2
United Arab Emirates	37 ↑	65.2	Lebanon	79 ↓	46.0	Syria	121 ↓	17.3
Indonesia	38 ↑	64.9	Croatia	80 ↓	46.0	Mauritania	122 -	15.3
Mexico	39 ↑	64.6	Jamaica	81 ↑	45.3	Burundi	123 -	15.0
Lithuania	40 ↑	64.0	Montenegro	82 ↓	44.8	Chad	124 ↑	13.4
Russian Federation	41 ↑	63.5	Botswana	83 ↓	44.8	Angola	125 ↓	11.5
Philippines	42 ↑	63.4	Kuwait	84 ↓	44.1			

Note: ↑ indicates a rank increase over a five-year period. ↓ indicates a rank decrease over a five-year period.

Table 2: The 2016 VC/PE Country Attractiveness Index Ranking

The Regional VC and PE Attractiveness Landscape

Our methodology allows calculating regional key driver scores as presented in Table 3. Note that these regional scores are not computed as “simple averages”. They result from weighting the individual data series of the countries corresponding to a particular region either by GDP or population, whatever is more appropriate. We realize that the higher ranked core markets have consistently better developed key drivers with the exception of economic activity. The table also reveals particular weaknesses of emerging and frontier markets with respect to their capital market depth, investors’ protection, their human and social environment, and related to that, innovation driven entrepreneurial and deal opportunities. We stress again that “Taxation” does not measure the levels of marginal corporate or capital gains tax rates. The key driver rather assesses incentives for entrepreneurship resulting from the differential of the personal and corporate income tax rates and the administrative burdens when determining and paying taxes.

Region	Index Rank	Index Score	1 Economic activity	2 Depth of capital market	3 Taxation	4 Investor protection and corporate governance	5 Human and social environment	6 Entrepreneurial culture and deal opportunities
North America	1	98.0	96.8	97.1	101.9	102.2	100.4	95.2
Australasia	2	90.8	90.2	82.4	107.2	107.7	101.2	85.5
Western Europe	3	80.5	84.1	70.6	111.7	87.7	86.2	80.6
Asia	4	70.0	93.2	65.0	93.6	69.5	61.6	66.8
Middle East	5	63.8	84.8	57.6	92.9	66.5	68.2	54.1
Eastern Europe	6	58.8	80.7	44.8	99.6	64.9	60.3	59.6
Latin America	7	54.5	81.7	48.4	87.2	55.0	46.8	50.1
Africa	8	44.3	76.0	29.2	86.0	56.2	47.2	42.1

Table 3: The Regional VC and PE Attractiveness Landscape

get in the graph the lower the maturity of these countries to support VC and PE transactions. However, investors should stay alert not to miss the right time to enter.

For more information and comparisons, we refer to the individual country profiles on our website <http://blog.iese.edu/vcpeindex/> where additional graphs, analyses, and benchmarking tools are available.

The BRICS, Turkey, Mexico, Indonesia, the Philippines, and Nigeria

The BRICS (Brazil, Russia, India, China, and including South Africa) have received substantial attention and VC and PE flows in recent years. China is among the top active countries world-wide, India and Brazil do not rank far behind. Brazil has substantially improved investment conditions and South Africa was already high ranked, due to its ties with the UK and the establishment of a similar legal and capital market oriented culture. Only Russia lags behind her peers, which is most probably related to some of the factors set out in the subsequent Exhibits. Nevertheless, investors meanwhile look beyond the BRICS and search for new emerging and frontier markets for allocations. Similar to the experiences with the BRICS, the race winning countries will probably be those with large populations and strong economic catch-up potential, notably Mexico, Indonesia, the Philippines, Nigeria and Turkey. The size of a population combined with expected economic growth is a simple indicator for deal opportunities. Nevertheless, we recall that this combination is necessary for emerging countries but not sufficient to guarantee appropriate VC/PE investment conditions. All of our defined key drivers should be taken into account. We compare the BRICS, Turkey, Mexico, the Philippines, Indonesia, and Nigeria in Exhibits 3 to 6.

Region	Index Rank	Index Score	1 Economic activity	2 Depth of capital market	3 Taxation	4 Investor protection and corporate governance	5 Human and social environment	6 Entrepreneurial culture and deal opportunities
China	24	77.1	108.4	86.7	110.6	57.8	50.9	75.9
India	29	69.9	103.0	79.5	84.7	62.7	43.7	62.9
South Africa	32	67.5	60.8	79.2	108.7	80.9	35.7	68.8
Turkey	33	67.2	89.5	75.0	107.5	64.1	46.4	56.9
Indonesia	38	64.9	95.6	75.6	66.7	55.3	40.4	60.4
Mexico	39	64.6	94.3	69.1	104.1	63.4	30.3	68.0
Russia	41	63.5	81.7	73.3	97.8	53.5	30.9	69.7
Philippines	42	63.4	93.4	72.1	84.2	52.7	54.2	48.8
Brazil	54	58.3	81.1	77.5	21.3	53.3	33.2	57.9
Nigeria	87	41.8	75.9	28.9	49.7	52.8	27.3	53.0

Exhibit 3: The Six Key Drivers for the BRICS, Turkey, Mexico, the Philippines, Indonesia, and Nigeria

Investors seek to capitalise on the combination between expected growth and the large populations. The graphs reveal that not only the economic soundness of the presented emerging countries is excellent. China, India, South Africa, Turkey, and Brazil have also developed a financial market infrastructure which ranks ahead of many of the developed countries. However, the exhibit also reveals the disequilibrium among the key driving forces of VC and PE attractiveness. Emerging VC and PE markets are characterised by peaks towards their economic activity. Despite meanwhile deep capital markets, the other important key drivers “Investor protection and corporate governance” “Human & social environment”, and “Entrepreneurial culture & deal opportunities” are poorly developed for most of them. This effect can be reconciled by considering the level-2 constructs.

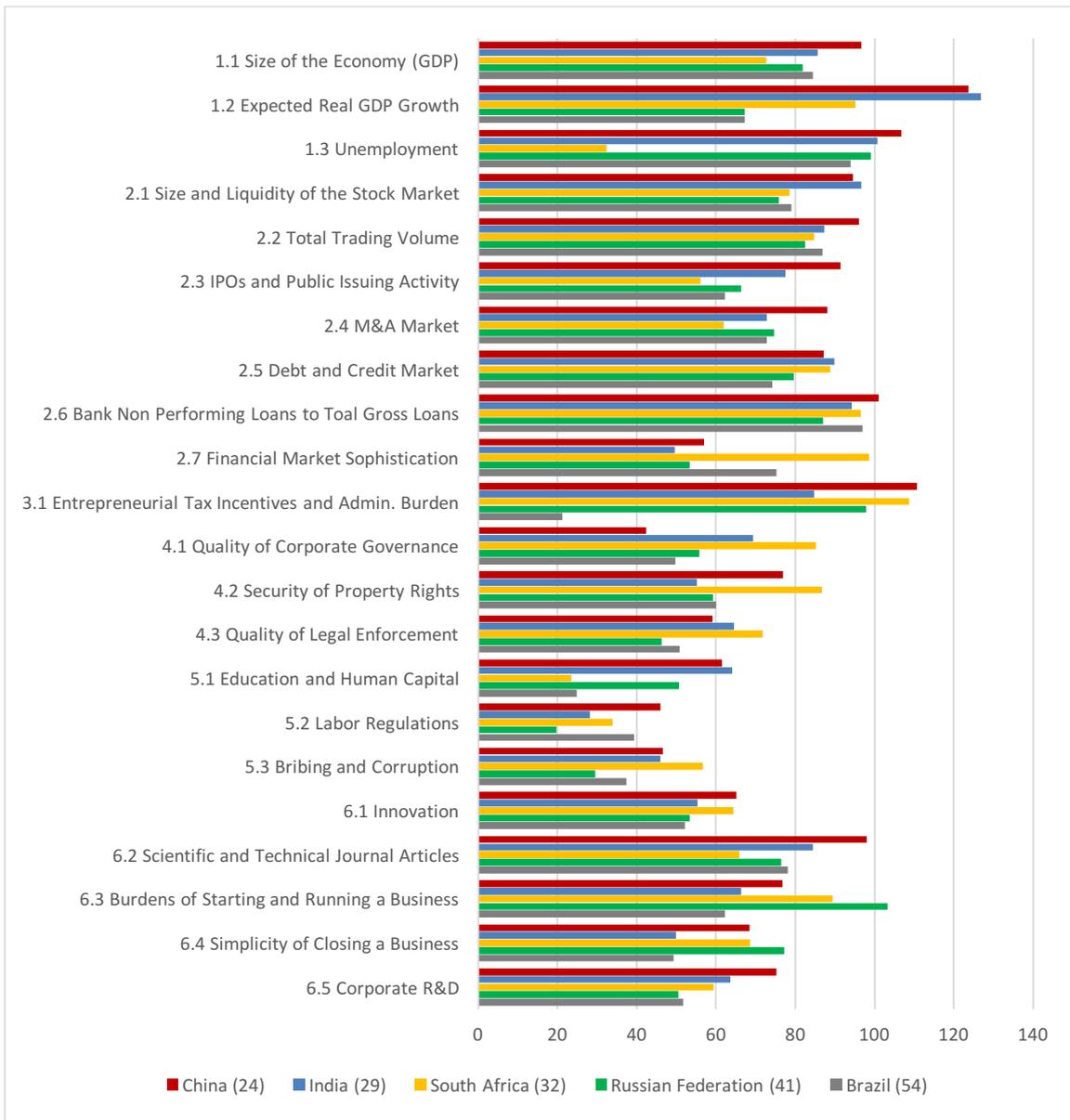


Exhibit 4: Level-2 Constructs for the BRICS

Exhibits 4 and 5 present the scores of the level-2 constructs for the BRICS, Turkey, Mexico, the Philippines, Indonesia, and Nigeria. They reveal the expectations of growth and the deep capital markets. However, they also point to general concerns about emerging market VC and PE in general. Corporate governance indicators (with the exception of South Africa) and investor protection still remain obstacles. Further, perceived bribery and corruption levels are high, while innovations and corporate R&D remain relatively low. We know from the BRICS and other emerging countries that growth and development are mainly concentrated in particular hubs or certain regions, but are not widespread. We also know that the benefit of wealth creation is often allocated among small elite groups and not larger parts of the population. This presents not only socio-economic and political challenges in those countries, but also affects their VC and PE attractiveness. If the countries cannot transfer the wealth effects of growth to a broader part of their population, this is unlikely to improve the other key driving forces for VC and PE attractiveness, and if the pace of economic growth slows down, the countries will be less attractive for VC/PE investors.

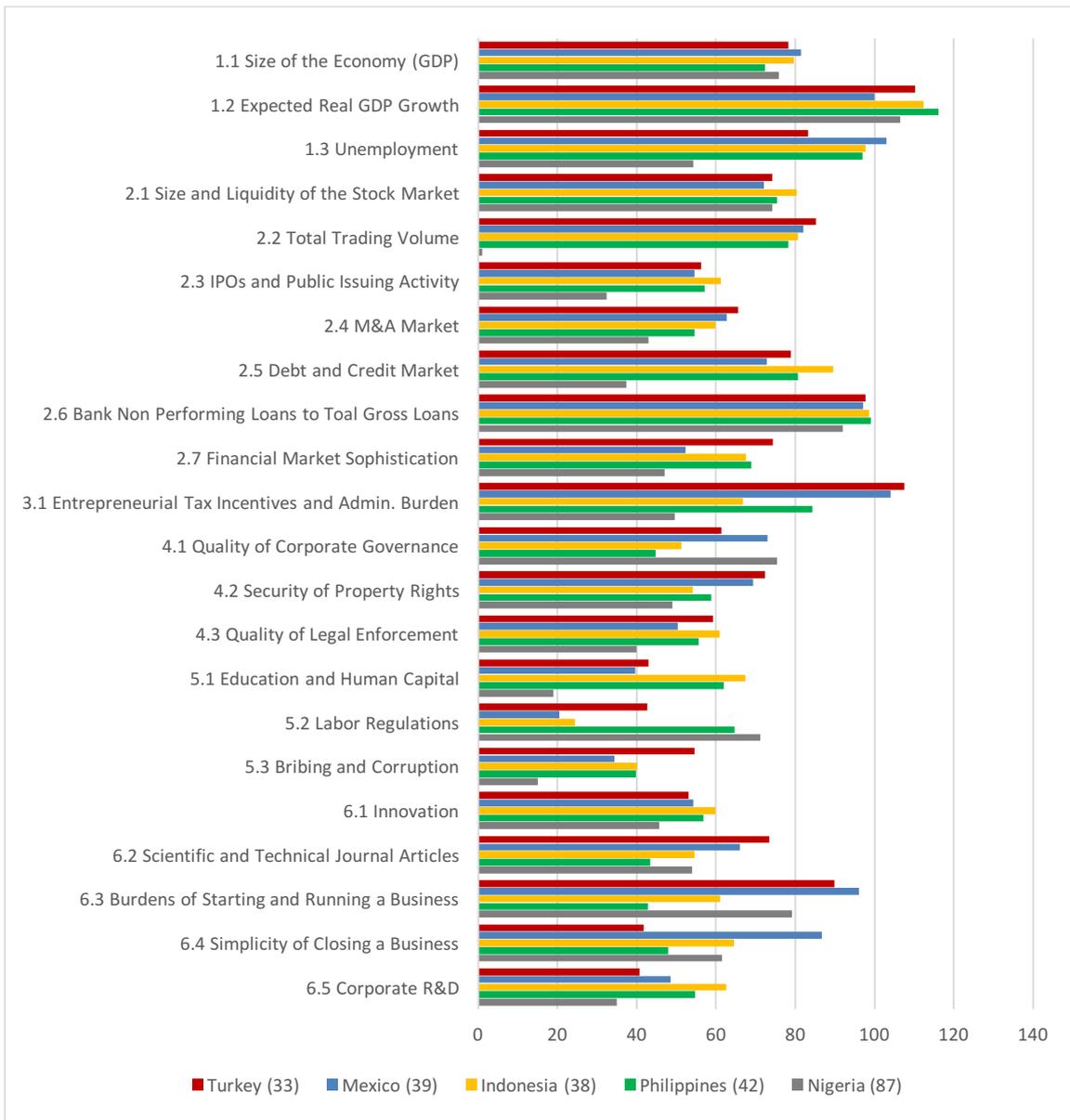


Exhibit 5: Level-2 Constructs for Turkey, Mexico, the Philippines, Indonesia, and Nigeria

In summary, the BRICS and the other emerging markets provide many investment opportunities and have strong financing requirements for their expected economic growth. However, it is more challenging in several emerging countries to get access to high-quality deals because of the relative immaturity of the institutional deal-supporting environment. Where corruption is present, it might be the case that the most promising transactions are negotiated among small groups of local elites while lemons are broadly auctioned. Hence, deal flow could be cumbersome and costly. Furthermore, if the protection of investors is insufficient, and if bribery and corruption are high, then the net returns to investors can suffer. Limited partners should carefully consider the advantages and disadvantages of the emerging opportunities as the exceptional growth comes at a certain cost.

Tracking Power of our Index

Our index ranks the attractiveness of countries to receive VC/PE allocations from institutional investors based on many socio-economic data series. The composite measure can deviate from the actual risk capital market activity and these deviations might point to an inaccuracy of our measure. With respect to their allocations, investors are often influenced by herding behaviour and follow trends to certain countries and regions, especially driven by growth expectations. However, the countries might not have sufficiently developed “VC/PE infrastructure” to absorb the committed capital, leading to over-funding. The VC/PE infrastructure is exactly what we aim to assess with our index: can we expect sufficient VC and PE deal opportunities resulting from the entrepreneurial culture in a country, from its economic soundness, or from innovations? Are potential transactions efficiently supported by the financial community? Are the public equity and M&A markets liquid enough to facilitate divestments? Are investors’ concerns legally taken care of? We do not claim that our index provides the correct answer to these questions, however we submit that it is comparatively helpful in this respect. Therefore, we expect deviations between our attractiveness measure and actual VC and PE activity in the particular countries to be at a minimum level.

To analyse the tracking power of our index, we compare the index scores with the actual VC and PE activity in the various countries using the data from Thomson One. Our activity measure is the logarithm of an average of all VC and PE investments made by the general partners in a certain country over the last three years. We use the logarithm to account for the large activity divergence (e.g. activity in the US vs. several emerging countries), and we use an average over three years to smooth fluctuations. For some emerging countries in particular, annual activity strongly fluctuates from peak levels to zero in subsequent years. We chose the criterion “location of the general partners” — and not of the investments — for the following reason: some financial centres serve as hubs and channel VC and PE abroad. Investors allocate their capital to these hubs because they can rely on the efficiency of the financial community there. This is exactly what we try to measure with our index. In fact, we focus on the demand for VC and PE in a particular economy, and similarly on the state of the professional financial community that supports the supply side and directs the funds to the investee corporations. In addition, we use investments — and not raised funds — because our index measures the “absorption capacity” (either caused by direct local demand or by channelling funds abroad) of the particular economies. Raised funds might deviate from this absorption capacity due to the herding behaviour of investors, caused by over-optimism or negligence.

The statistical measure for such a comparison is the Pearson correlation coefficient. It lies between 0 and 1, where 0 signals “no” and 1 “perfect correlation.” The coefficient for our index is 0.63, signalling that the index excellently tracks world-wide activity. We illustrate this high correlation in Exhibit 6.

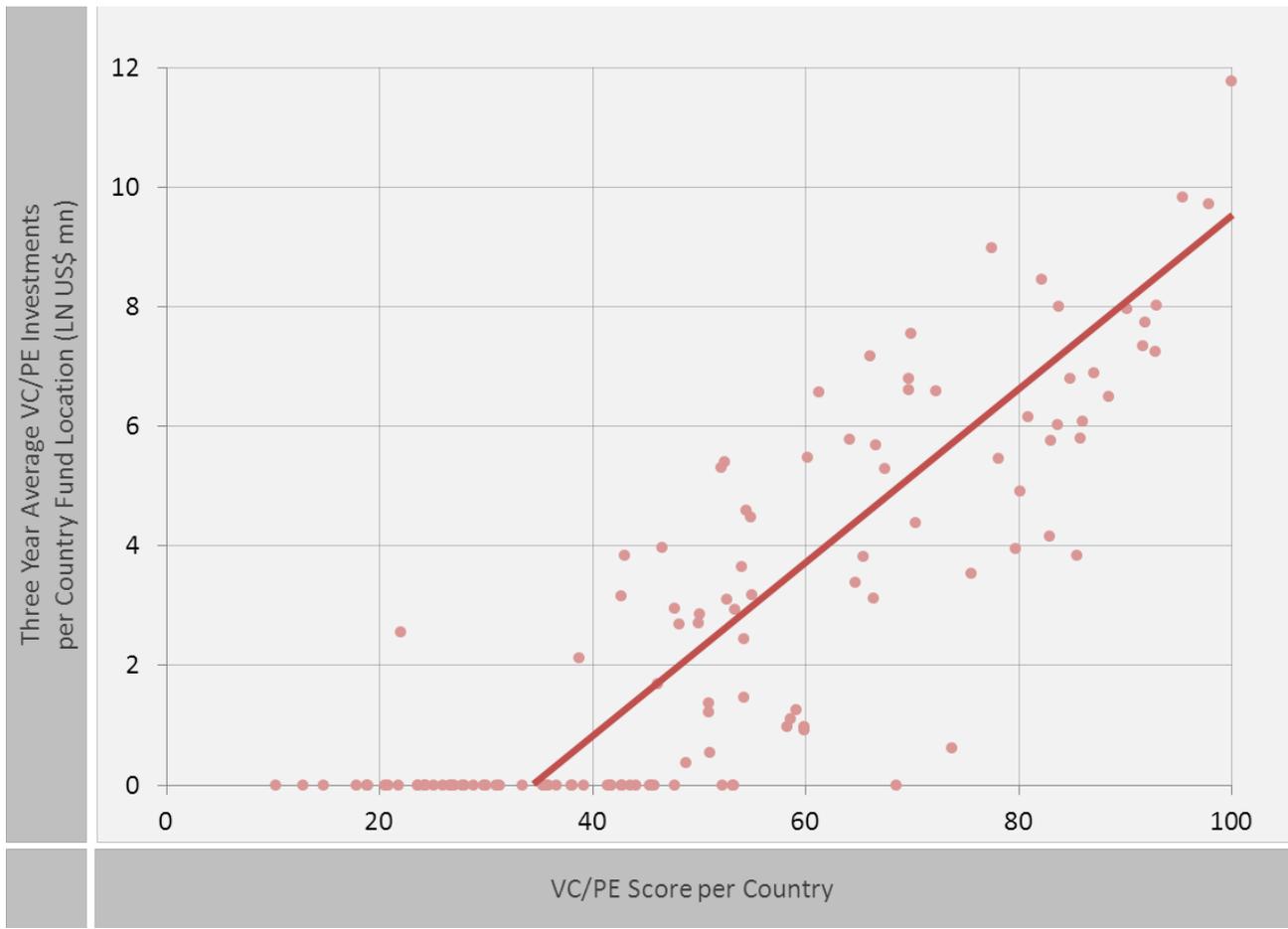


Exhibit 6: Tracking Power of our Index

Exhibit 6 shows the tracking power of our index. We plot the countries' investment activity on their index scores and identify a strong link. The exhibit further illustrates that we only observe VC and PE activity at index levels above approximately 45 points. For countries with scores below this level, no activity is (publicly) reported. Hence, 45 points can be considered a threshold for the emergence of VC and PE activity.

Our Index and Historic VC and PE Returns

Concurrent to the finding that our index performs well when tracking VC and PE activity, it is of particular interest to analyse whether it also corresponds with the average performance achieved in the particular countries. Unfortunately, performance figures are still one of the best kept secrets in the VC and PE industry. The principle of non-disclosure of information on returns is equally valid in developed and in emerging markets. In addition, the emerging VC and PE markets are young with generally low activity (despite some exceptions), and hence there are very few transactions from which achieved returns can be calculated. Therefore, an assessment of VC and PE performance is even more challenging for the developing countries than for the developed. Commercial data suppliers provide only very limited performance figures. The only way to obtain reliable performance data on a sufficient number of transactions for empirical analyses is via an extensive effort to collect private placement memoranda (PPMs). A private placement memorandum is a document edited by a general partner that raises a VC/PE fund and solicits capital commitments from institutional investors. It is a marketing document used for fundraising purposes. General partners provide information about their track records and the performance of individual transactions in PPMs. The figures are audited and investors trust them. However, only successful general partners raise a subsequent fund and edit a PPM. Therefore, their use is criticised by academic researchers, as average performance figures from PPMs are upward biased. Nevertheless, there is no reason to believe that this upward bias is different among particular countries. This means that benchmarking countries is feasible: because the countries are compared on a consistent relative basis, absolute terms are not important.

Using PPMs, Lopez-de-Silanes, Phalippou and Gottschalg (2010) put together the most comprehensive database on VC and PE returns at the investment level, containing the performance and characteristics of 7,453 investments, of which 1,694 were in emerging countries. The first transaction considered was closed in 1971 and the last prior to 2006. We are grateful to Ludovic Phalippou for providing us with aggregated country returns from this database. These returns are compiled as the mean average of gross internal rates of return of all transactions in a particular country. We are aware that this is a rough estimate, disregarding different fund vintage years, industries, deal structures and development cycles of the particular VC/PE markets. Unfortunately, controlling for these effects is impossible with the data available. In addition, an IRR is a capital- and time-weighted return measure that requires a reinvestment assumption and that has aggregation issues as described in Phalippou (2008). However, the IRR pitfalls are the same for all transactions and for all of our countries. Therefore, they do not affect our cross-sectional country benchmarking approach.

With these aggregate performance measures, we can not only analyse the extent to which our index tracks VC and PE market activity, but also the average country returns. We note that the Lopez-de-Silanes, Phalippou and Gottschalg (2010) data include transactions in four emerging markets with index scores below the previously discussed cut-off rate of 45 points. However, these transactions took place several years ago and are not reported in the Thomson One database. We can match the index scores of 48 countries (of which 24 are emerging countries) with their aggregate performance data. There are at least 10 observed IRRs for each country. We find that the correlation between the index scores and a country's average gross internal rate of return is 0.62. This high correlation is presented in Exhibit 7, which plots the average of the country returns on their index scores.

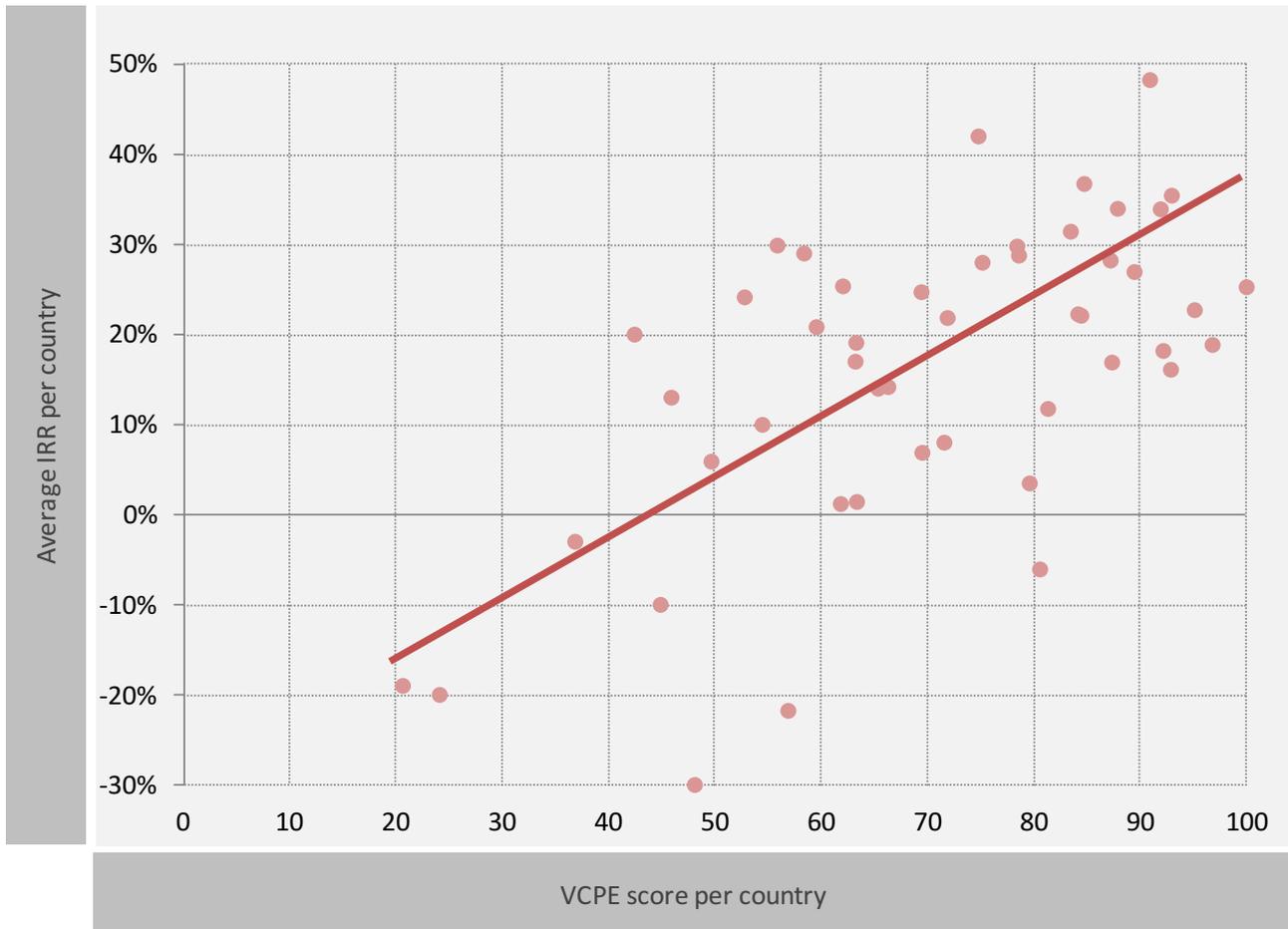


Exhibit 7: Historic Performance and our Index

Exhibit 7 shows that our index is not only a valid proxy for VC and PE activity; it is also a good indicator for aggregate historic country returns. It is evident that the averages of historic gross internal rates of return were larger in countries that rank higher in our index than in low-ranked countries. The regression line has a slope of 0.55 %, signalling that a one point increase in the index score comes with a 0.55% rise of average historic IRRs. Nevertheless, there are “outliers,” meaning low ranked countries with high returns and vice versa. Additionally, there is a strong dispersion of returns within each particular country, driven by very successful transactions and complete write-offs in any of them. We highlight that the internal rates of return collected by Lopez-de-Silanes, Phalippou and Gottschalg (2010) are calculated gross of any fees. We can assume that fees are higher for investors in immature markets with less competition among general partners. Therefore, we expect the less competitive emerging countries to be more costly for investors. This effect supports our result and would be expected to increase the correlation if we considered net returns to investors.

Nevertheless, analyses with return data have to be treated with caution as historic returns are not necessarily good proxies for future returns. Additionally, for 11 emerging countries the number of recorded deals is between 10 and 20 only. Therefore, their IRR averages can be affected to a greater extent by outliers.

Summary and Outlook

We provide a composite measure that determines the attractiveness of 125 countries to receive capital allocations from investors in the VC and PE asset class. The composite measure is based on six main criteria: economic activity, depth of the capital markets, taxation, investor protection and corporate governance, the human and social environment, and entrepreneurial culture and deal opportunities. The definition of these criteria is based on an extensive review of academic literature, on a survey of institutional investors we conducted prior to our study, and on our own econometric analyses. The six criteria are not directly observable. Therefore, we use proxy variables to assess them for each country. As a result, we obtain a country ranking and provide detailed analyses on the strengths and weaknesses of the particular nations and information on the historic development of the criteria. Our index performs well in terms of explaining the differences of observed VC and PE activity, and excellently tracks historic country performance. However, it does not qualify as a crystal ball for investment advisers. We highlight our intention to enrich the discussion regarding national VC and PE markets and to propose a valuable informational tool, rather than an arbitrage instrument.

We find a general pattern if we compare country characteristics. There is considerable dispersion with respect to the six key drivers. Some countries attract investors with tax incentives. Many countries show strong entrepreneurial culture and deal opportunities. There is great dispersion in economic activity, especially with respect to emerging markets and in the human and social environment. However, the two key criteria, depth of capital markets, and investor protection and corporate governance make the difference across the large sample. Common law countries dominate the others regarding these criteria. We observe that strong investor protection and corporate governance rules favour deep and liquid capital markets. These elicit the required professional community to secure deal flow and exit opportunities for VC and PE funds which affects a country's attractiveness for institutional investments in the VC and PE asset class.

However, this discussion reflects the capital supply side only. We should also take into account that, as revealed by our analyses, many countries lack several important characteristics. Without a sufficient entrepreneurial culture, and with rigid labour markets, bribery and corruption, there will be firstly less demand for VC and PE, and secondly returns to investors will diminish.

Emerging VC and PE provide interesting opportunities to investors. However, it is the discussed lack of balance of the key driving forces that renders emerging VC/PE allocation decisions challenging. Exceptional growth opportunities come at the cost of disadvantageous conditions with respect to investors' protection, usually less liquid exit markets, lower innovation capacity and higher perceived bribery and corruption.

We invite you to examine and thoroughly analyse our results. If you are an investor, please enrich the information provided with your own expertise and knowledge about the key driving forces and market conditions in the individual countries to make your allocation decisions. If you are a politician, please use our analyses as a demonstration of how investors can evaluate and benchmark countries. If you are a researcher, and this is equally valid for the whole constituency, please do not hesitate to criticise our approach and findings. We will continue to update our index annually and very much appreciate any critique and comment.

Appendix 1: Computation of the Index

The VC/PE attractiveness of each country is computed by calculating a weighted average of country performance scores in the six key drivers. The scores within each key driver are derived from the level-2 constructs, respectively derived from several raw data series.

Normalisation

In order to make the cross-sectional data series comparable, the raw data has to be converted into a common range. The rescaling method is used to normalise indicators to such a range by linear transformation. Thereby, 100 represents the best score, while 1 represents the worst.

For every individual variable, we define whether high values influence the attractiveness for investors positively or negatively, and hence, assign 100 points either to the highest score (e.g. in the case of GDP) or to the lowest (e.g. in the case of high hiring costs).

The points are calculated according to the following formula:

$$y_{q,i} = 99 \times \left[\frac{x_{q,i} - \min(x_q)}{\max(x_q) - \min(x_q)} \right] + 1$$

$y_{q,i}$ = normalised value of category q and country i

$x_{q,i}$ = raw data value of category q and country i

$\min(x_q)$ = Minimum raw data value of category q within the sample

$\max(x_q)$ = Maximum raw data value of category q within the sample

Example:

Raw data value [any unit]	1 (lowest value in sample)	12 (random value in sample)	20 (highest value in sample)
Normalised value [1-100]	$99 \times [(1-1)/(20-1)] + 1 = 1$	$99 \times [(12-1)/(20-1)] + 1 = 58$	$99 \times [(20-1)/(20-1)] + 1 = 100$

Aggregation

For the index score calculation, we use geometric aggregation because it is better suited than arithmetic aggregation. Geometric aggregation rewards those countries or those sub-indicators with higher scores. Overall, a shortcoming in the value of one variable or sub-index can be compensated by a surplus in another. Compensability is constant in linear aggregation, while it is smaller in geometric aggregation for the sub-indicators with low values. Therefore, countries with low scores in some sub-indices would benefit from linear aggregation.

For this reason, we use geometric aggregation as follows:

$$Index\ Value_i = \prod_{q=1}^Q y_{q,i}^{w_q}$$

$Index\ Value_i$ = index value of country i

$y_{q,i}$ = normalised value of category q and country i

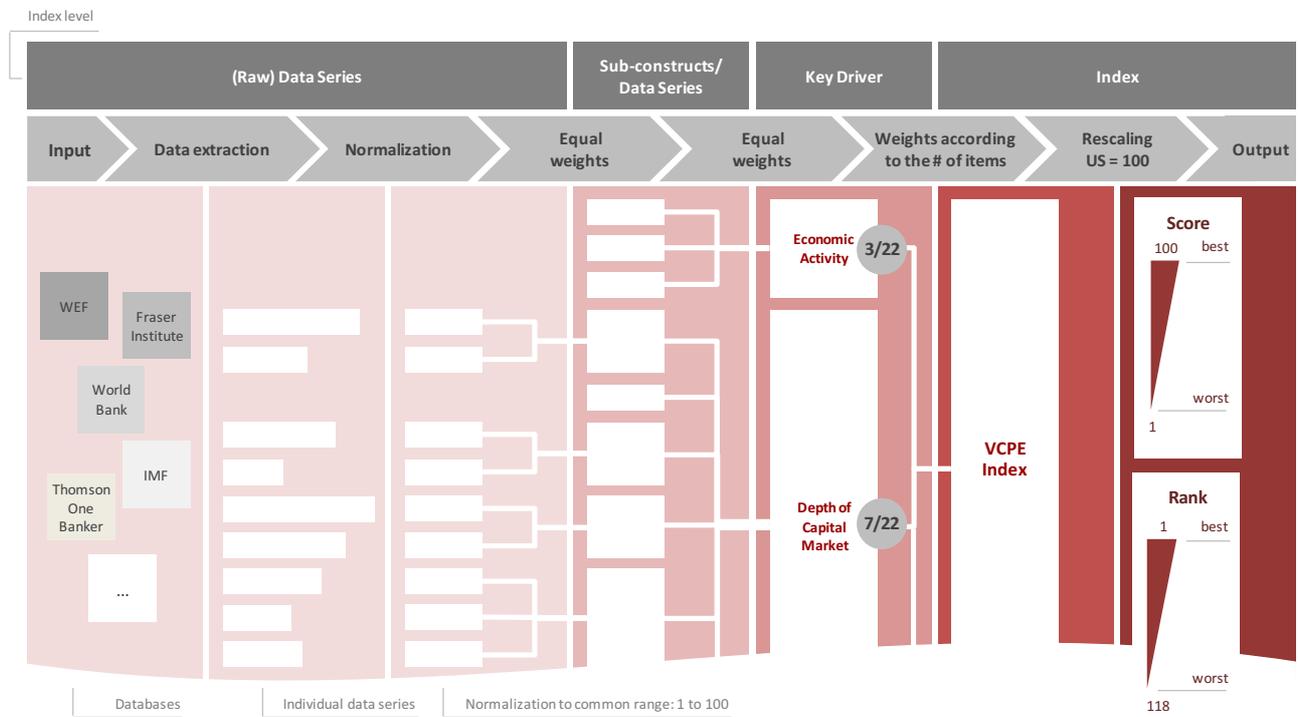
w_q = weight of category q

Example:

Category	Economic Activity	Depth of Capital Market	Investor Protection & Corporate Governance
Weight	0.50	0.25	0.25
Normalised value of country i ($y_{q,i}$)	30.0	40.0	50.0
Index value for the country	$(30^{0.5}) \times (40^{0.25}) \times (50^{0.25}) = 36.6$		

Weighting

After calculating the performance scores for each data series on the lowest level, the scores are aggregated using the aforementioned aggregation method. On the lowest level, items are aggregated with equal weights, i.e. the weights are derived from the number of components that are aggregated. The following exhibit shows the aggregation path from the normalised (raw) data series to the final VC/PE Country Attractiveness Index score.



Appendix 2: Statistical Validation of the Index

Correlation is a measure for the strength and directionality of a *linear* relation between two variables. The Pearson-Correlation-Coefficient $\rho_{X,Y}$ lies between 0 to ± 1 . Zero indicates a non-linear or missing relation between two data sets and ± 1 indicates perfect linearity. A positive (negative) correlation indicates a positive (negative) relation.

$$\rho_{X,Y} = \frac{cov(X,Y)}{\sigma_X\sigma_Y} = \frac{E((X - \mu_X)(Y - \mu_Y))}{\sigma_X\sigma_Y}$$

To test the quality of our index, we calculate the correlation between the index scores with the control variable. The results of these analyses are displayed in the following table. The correlation coefficients are very high for all cases considered. These high values prove the accuracy of the index scores and its ability to measure a countries' attractiveness for investors in VC and PE funds. It should be noted, however, that the accuracy and the volumes of reported VC investments is lower than for PE. Therefore, the correlations for the combined VC/PE and for the PE Index are somewhat higher than for VC.

	VC/PE investments LN (average 2013–2015)	VC investments LN (average 2013–2015)	PE investments LN (average 2013–2015)
VC/PE Index 2016	0.63	-	-
VC Index 2016	-	0.62	-
PE Index 2016	-	-	0.61

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This report presents the results of a comprehensive research project on how to measure the attractiveness of a country for equity capital investors. Designed to be an index produced annually, it is a dynamic product – an online version that uses the most recent data and allows for country comparisons can be found at <http://blog.iese.edu/vcpeindex/>.