

CURRENCY IMPACT IN BRAZILIAN PE/VC DEALS PERFORMANCE

Insp-Spectra Analysis – March 2015

Many PE/VC firms that invest in Brazil raise capital with international investors. Funds call capital in US dollars and convert it into Brazilian Reais to invest in portfolio companies. At the time of exit, they receive the proceeds in Brazilian Reais and convert them back into US dollars. As performance and profits mostly common are measured in US dollars, and as the investments are in Brazilian Reais, funds run currency risk.

This paper analyzes how currency risk and other macroeconomic variables have affected performance of the Brazilian PE/VC investments in the last 20 years. The source of the analysis is the Spectra-Insp database, a comprehensive set of information about private equity organizations, funds, deals and people in Latin America.

This private dataset has been built through a partnership between Spectra Investments, a Brazilian investor in PE and VC funds and Insp Institute of Education and Research, a leading Brazilian Business and Economics School. In order to protect firms, funds and deals identities, Spectra Investments sanitizes the data before filling it in the database. Main source of information are Private Placement Memoranda in possession of Spectra, although some data were hand collected from CVM (Comissão de Valores Mobiliários - Brazilian Security Exchange Commission) and other sources like Thomson TRAA.

Main highlights:

- Currency risk is irrelevant for the long term performance of LPs and PE/VC firms.
- The impact at the deal level may be substantial, impacting performance fee.
- Although there is diversification across deals, depending on the vintage, some funds may not be able to diversify across cycles, and foreign exchange risk may affect funds' performance.
- Currency appreciation/devaluation misleads assessment of GP's track records.
- PE/VC Brazilian deals realized and liquidated between 1994-2014 outperformed Brazilian public market alternatives: IBOVESPA¹ and CDI² and US public market alternatives: Nasdaq, S&P 500 and 10 years T-bond.

¹ BOVESPA index: The Sao Paulo Stock Exchange Index, used as benchmark for Brazilian stock market performance

² CDI (Certificado de Depósito Interbancário): interest rate of Brazilian Interbank Deposit Certificate, used as benchmark for Brazilian risk free interest rate.

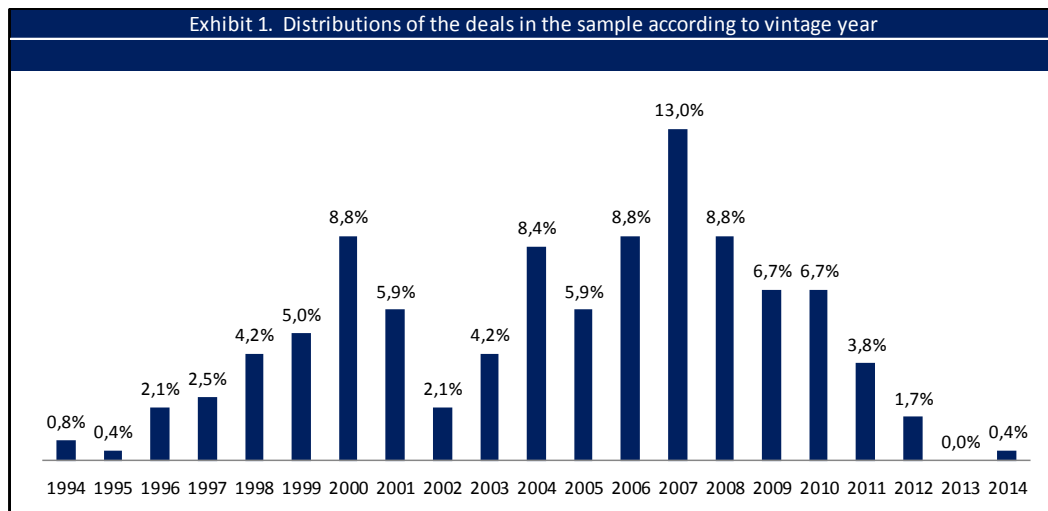
Sample information

Our sample contains PE and VC deals invested between 1994 and 2014 that are fully liquidated. We excluded:

- write-offs and other deals with missing information about divestment date
- deals missing both information: IRR and MoM (Multiple of Money, that is, cash inflows divided by cash outflows)

The final sample has 239 observations. Exhibit 1 contains the distribution of the deals according to vintage year (the year the fund invests in the portfolio company). We observe that 90% of the deals have vintage between 1997 and 2010, and vintage 2007 alone concentrates 13% of the investments.

As we do not have cashflow information, we considered that all cash outflows were disbursed at investment (entry) date, and all cash inflows were received at liquidation (exit) date.



Currency impact is irrelevant for the long term performance of LPs and PE/VC firms

In the long term, currency impact is irrelevant. The BRL appreciation per year³ in a portfolio containing all 239 deals invested between 1994 and 2014 is 0.4%, that is, practically zero.

As long term LP and PE/VC firm invest or manage a portfolio of many deals with vintages spread throughout time, diversification mitigates currency risk, and they should be more worried about performance in BRL than performance in USD.

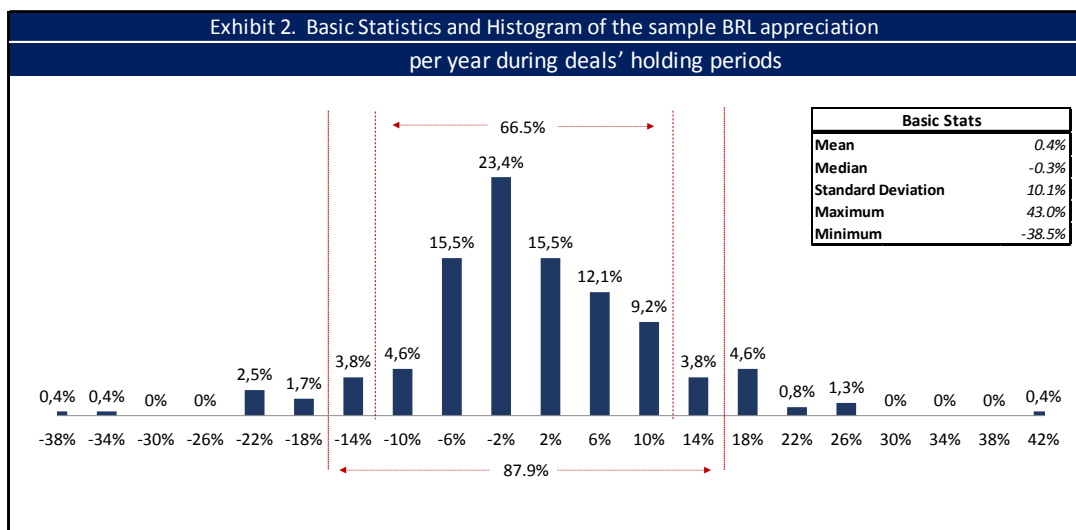
³ For each deal, we collected the exchange rate BRL/USD at the day the fund invests in the deal (entry) and at the day the funds exist the deal (exit). We used PTAX as conversion rate. We calculated the BRL appreciation per year according to the following expression:

$$\text{BRL appreciation per year} = \left(\frac{\text{BRL/USD}_{\text{entry}}}{\text{BRL/USD}_{\text{exit}}} \right)^{1/T} - 1, \text{ where } T = \text{holding period in years}$$

Currency impact may be substantial for single deal performance

Contrary to the finding above, currency impact for a single deal may be substantial. Exhibit 2 contains basic statistics and the histogram of the BRL appreciation per year during deals' holding periods. Although mean and median are close to zero, the dispersion is high:

- 23.4% of the deals in our sample had a BRL appreciation per year between -4% and zero⁴.
- 33.5% of the deals had a BRL appreciation per year over -12% or +12%;
- 12.1% of the deals had a BRL appreciation per year either over -16% or +16%.



General Partners may not receive performance fee (carry) of deals that performed well in BRL because of currency devaluation. We make a sensitivity using a preferred return⁵ of 8% and estimating the probability of a GP not receiving carry given different levels of IRR in BRL⁶. We report the results in Exhibit 3:

- A deal with an IRR in Brazilian Reais of 10% will not generate performance fee if the BRL devaluation per year in the holding period is higher than -1.8%. The probability of this scenario is 41.8%.
- A deal with an IRR in BRL of 20% will not generate performance fee if BRL devaluation per year is higher than -10%. This scenario has a probability of 10.5%.

⁴ -2% in the horizontal axis in Exhibit 2 represents the range of BRL appreciation per year between -4% and zero. 23% of the deals in the sample had BRL appreciation per year in this range. 2% represents the range between 0% and 4%, and it contains 15% of the deals in the sample. -6% represents the range between -8% and -4%, and 15% of the deals in the sample had BRL appreciation per year in this range.

⁵ deals with IRR in USD lower than 8% do not generate performance fee

⁶ For doing this analysis we estimate the BRL devaluation (or negative appreciation) per year that makes the IRR in USD equal to 8% according to the following relation:

$$\text{Minimum BRL appreciation per year} = ((1.08)/(1+\text{IRR BRL}))-1$$

We used the sample distribution of BRL appreciation per year to see the probability of having a currency appreciation lower than the minimum. For instance, according to Exhibit 2, the probability that a deal has a BRL appreciation lower than -16% (or a BRL devaluation higher than 16%) is 5%.

Exhibit 3. Sensitivity analysis of currency impact in deal performance

IRR _{BRL}	BRL annual devaluation hurdle (%)	Historical Probab.
10,0%	-1,8%	41,8%
20,0%	-10,0%	10,5%
30,0%	-16,9%	5,4%
40,0%	-22,9%	1,7%
50,0%	-28,0%	1,3%
60,0%	-32,5%	0,8%
70,0%	-36,5%	0,0%

Currency risk may create incentive problems. If there is a significant currency devaluation, and the probability of not receiving performance fee becomes high, even if the investment performs well in BRL, General Partners will have the challenge to motivate their teams to remain onboard.

Currency impact is cyclical, and it may affect performance at the fund level

Exhibit 4 shows the fluctuation of BRL/USD exchange rate at the investment date. The horizontal axis has the deal vintage year, and the vertical axis the exchange rate at the investment day. Each plot corresponds to a single deal. We observe that, after 1998, dispersion in BRL/USD rate is high even across deals of a specific vintage year. See for instance 2002, when BRL/USD rate fluctuates from 2.4 to 3.6, and 2004, from 2.8 to 3.5. We also observe cycles of BRL appreciation and cycles of BRL depreciation.

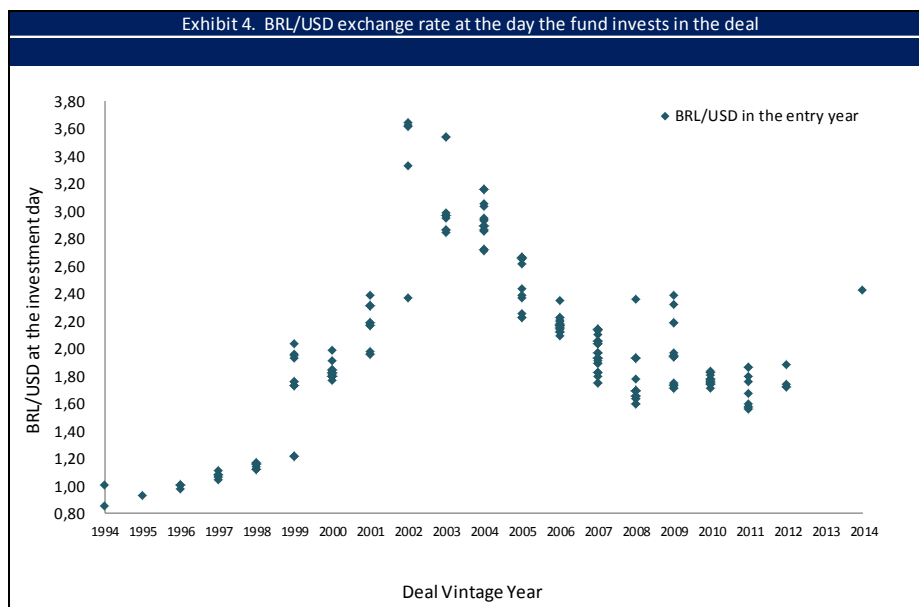
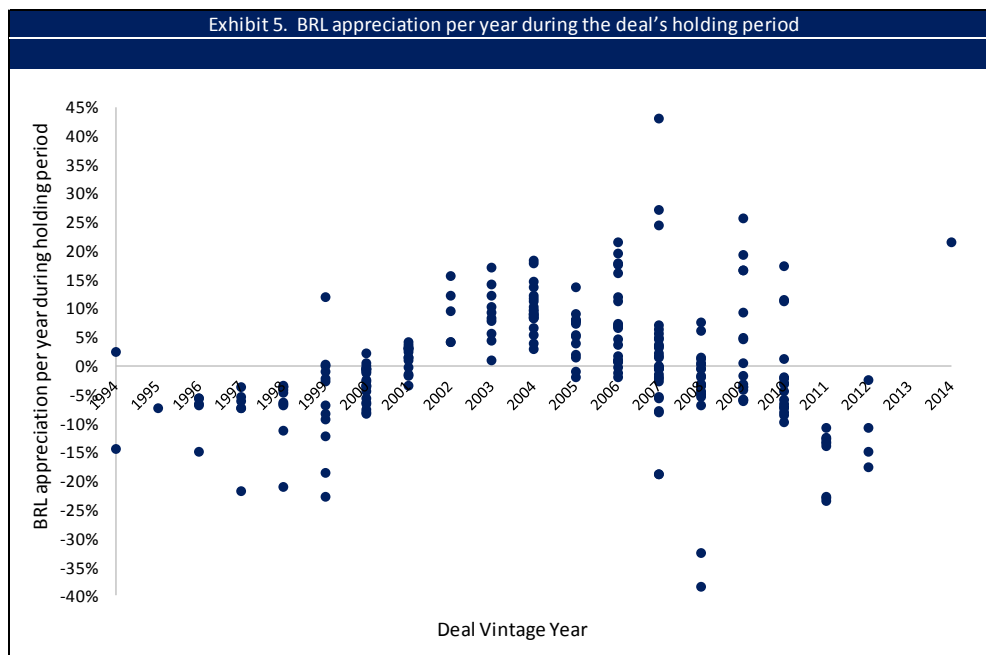


Exhibit 5 shows the dispersion in BRL appreciation per year during deal holding period. Investing when the local currency is appreciated implies in buying expensive BRL for 1.00 USD. That increases the probability of having a local currency devaluation, and consequently a negative impact in USD performance. See for instance the vintages 1994 until 2000 (BRL/USD exchange rate between 0.8 and 2.0). We observe in Exhibit 5 that with few exceptions deals from these vintages had BRL devaluation (or negative

appreciation), independently of the length of the holding period, and this affected negatively IRR in USD.

The opposite is also true. Investing when the local currency is undervalued implies in buying cheaper BRL for 1.00 USD, increasing the probability of having a local currency appreciation that inflates IRR in USD. See for instance vintages 2002 until 2006 (BRL/USD exchange rate between 2.1 and 3.6). With few exceptions, deals from these vintages had BRL appreciation per year, inflating their performance in USD.



Funds raised in the beginning of a BRL devaluation cycle will have positive currency impact in most of their deals, and funds raised in the beginning of a BRL appreciation cycle will have negative currency impact in most of their deals. Therefore, even if funds are portfolios of deals, they will not be sufficiently diversified throughout time to mitigate currency risk.

Funds that invest in the beginning of a devaluation cycle are candidates for incentive problems. One example is the possibility of higher turnover rate in GP team. Talented human resources may quit the firm if they do not see perspective of receiving carry in the medium term.

The currency impact in the short and medium term for international limited partners should be irrelevant. International investors usually invest in PE/VC funds of different countries, and currency diversification mitigates currency risk in the short and medium term.

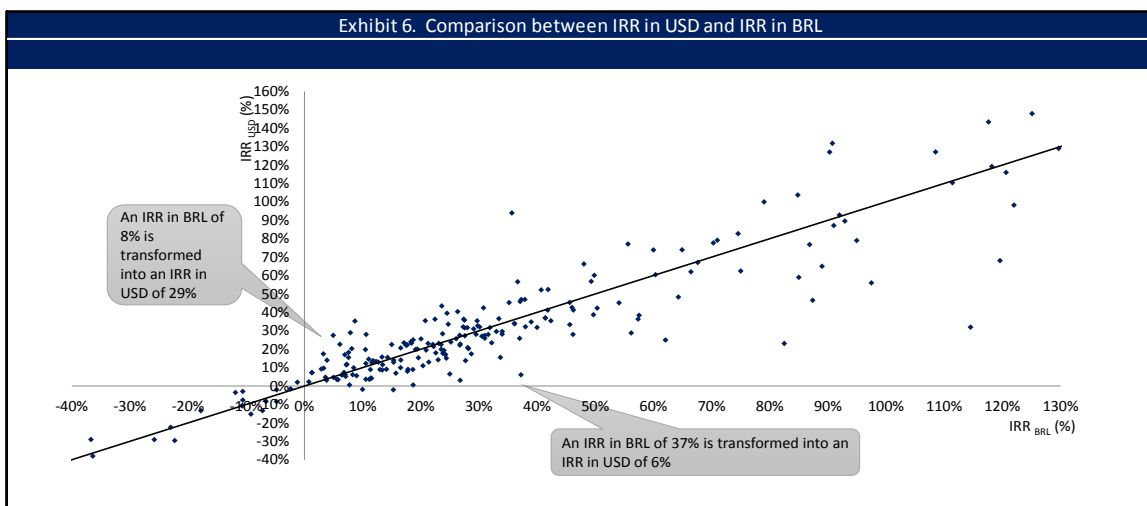
In the long term currency, risk is irrelevant for LP and PE/VC firms, because good cycles compensate bad cycles.

Local currency appreciation misleads USD performance at the deal level, and possibly at the fund level.

Exhibit 6 compares IRR in BRL (horizontal axes) with IRR in USD ⁷(vertical axes). Plots correspond to deals.

IRR in USD may be misleading to judge track records of General Partners. Currency devaluation may transform exceptional performance in BRL into mediocre returns in USD. See for instance that one deal with an IRR in BRL of 37% has an IRR in USD of 6%. The opposite is also true. Currency appreciation may also convert mediocre return into exceptional returns. See for instance the deal with an IRR in BRL of 8% and an IRR in USD equal to 29%.

Limited Partners should require performance data in local currency for accessing the real picture about General Partners’ track records and make good judgment about its ability in generating high performance deals.



Brazilian PE/VC investments with vintage 1994-2014 outperformed IBOVESPA, CDI, S&P 500, Nasdaq and 10 years T-bond

Public Market Equivalent (PME) indicates how PE/VC investments perform in relation to alternative public market investments. A PME of 1.0 indicates that PE/VC investment had the same return as the alternative public investment. A PME of 2.0 indicates that PE/VC investments returned two times more than the equivalent investment in the public market, and of 0.5 half of the alternative investment.

We estimated PME (Public Market Equivalent) for each deal⁸. As we do not have cash flow information, we considered that all cash outflows were disbursed at the investment

⁷ $IRR_{USD} = (1 + IRR_{BRL}) * (1 + \text{BRL appreciation per year during holding period}) - 1$

⁸ $PME = \text{MoM of PE investment} / \text{MoM of alternative public investment}$

MoM (Multiple of Money) in BRL = BRLs received for 1.00 BRL of investment

MoM (Multiple of Money) in USD = USDs received for 1.00 USD of investments

date, and that all cash inflows were received in the divestment date. We included back writeoffs with missing exit data information, and assumed conservatively that they had total losses, and therefore a PME of zero. As we have information of gross MoM, we multiplied our figures by 0.8 in order to estimate net PME, assuming that fixed and performance fees accounts for 20% of proceeds.

PE/VC investments in our sample outperformed on average Ibovespa and CDI (proxy for Brazilian risk free rate). We obtained an average a net PME for Ibovespa of 1.3 and for CDI of 1.2, where CDI is the Brazilian interbank interest rate, usually used as a proxy for risk free rate. In Exhibit 7 we observe that PE/VC outperformed public equivalent investments in all vintage years after 2005.

PE/VC investments also outperformed on average S&P 500, Nasdaq and 10 Y T-bond. Net PME were substantially above 1.0: 2.2 for S&P 500, 2.1 for Nasdaq and 1,9 for T-bond. Exhibit 8 shows average PME for vintage years. We observe that Brazilian PE/VC deals outperformed US public equivalent investments after 1997, with exception of most recent years: 2011 and 2013. It is important to highlight that the performance of Brazilian deals in USD with vintages between 1994 until 1999 was negatively impacted by currency devaluation, and of vintages between 2002 and 2006 was positively impacted for currency appreciation.

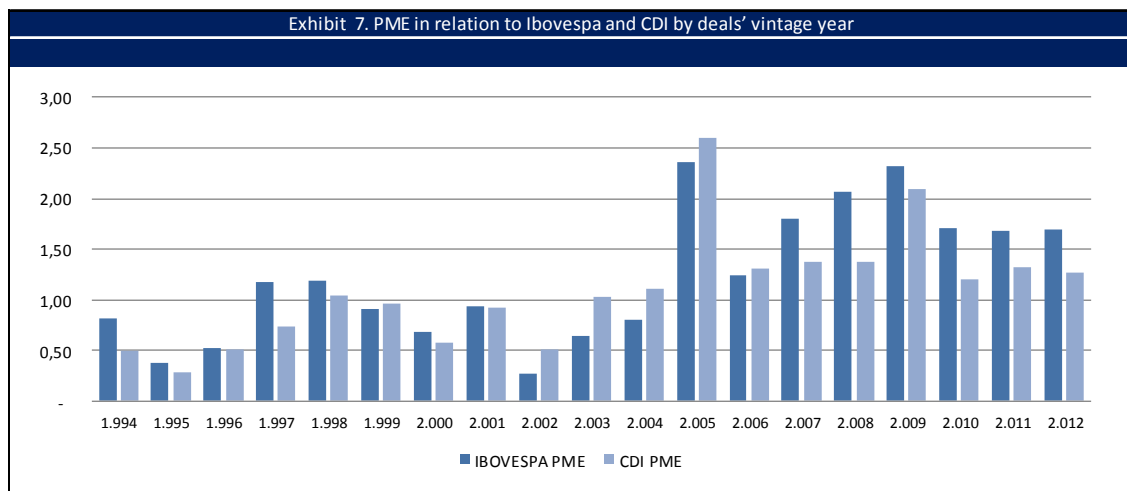
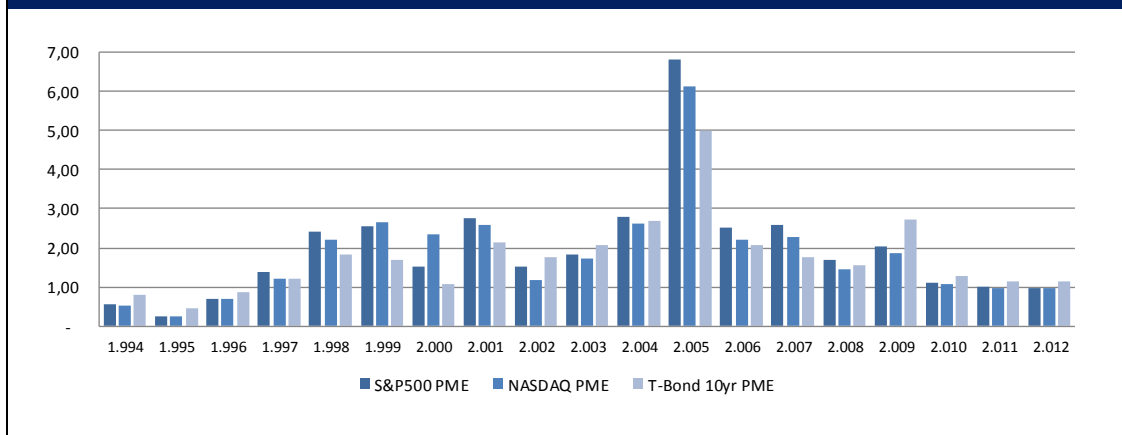


Exhibit 8. PME in relation to S&P 500, Nasdaq and T-bond by deals' vintage year



Concluding remarks

- Brazilian currency risk is irrelevant for foreign limited partners. As they invest in many countries, they are diversified in foreign currencies exchange rates. They are also long term investors, and good cycles of currency appreciation compensates for bad cycles.
- Brazilian currency risk is also irrelevant for PE/VC firms' long term performance, because good cycles of currency appreciation compensates for bad cycles.
- BRL/USD currency rate fluctuates significantly in Brazil and currency impact is substantial at the deal level.
- Currency risk also affects funds' performance that invest in the beginning of a currency devaluation cycle, decreasing performance in USD, and in the beginning of a currency appreciation cycle, increasing performance in USD.
- Currency impact at deal level and at fund level may create incentive problems. GPs may have an incentive to make less effort in deals that face substantially currency devaluation, and have high probability of not receiving carry. Talented human resources may quit PE/VC firm if currency risk destroys the perspective of receiving carry in medium term.
- LPs should require performance information in local currency to have a real picture of GPs track records and judge well its ability in generating high performance deals. BRL appreciation misleads track records of General Partners.
- Brazilian PE/VC investments in the last 20 years outperformed IBOVESPA, CDI, S&P 500, Nasdaq and T-bond.

Spectra-Insper Database

Spectra-Insper database contains information about PE and VC organization, funds, deals and people. The information used in this report is based mainly on data from Spectra Investments. This data is collected through PPMs and in interviews with organizations and is updated up to December 2014. Confidential information from Spectra is sanitized before being uploaded into the database.

The partnership between the Strategy Center of Insper and Spectra Investments, has the objective of continually maintaining and upgrading this database.

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