

Insights into the Private Capital Industry using the Private Capital Research Institute Database

Part 2: Overview of Private Capital Investments and Exit transactions

This is the second article in a series of articles about the Private Capital Research Institute database. These articles aim to provide a brief overview of the research being done at the PCRI and the data that is being collected. For more specific details on the database (for instance, variable definitions and database structure), please refer to the PCRI Data User Manual available at www.privatecapitalresearchinstitute.org.

Despite the size of the modern-day private equity and venture capital market, there is still no single, authoritative source for private capital data. To address this knowledge gap, the Private Capital Research Institute (PCRI) has been working since 2010 to build a comprehensive research database on private capital funds and transactions, to organize a community of scholars, to sponsor unbiased academic research on the nature and effects of private capital, and to disseminate the findings of this research to policy makers and the public at large. The PCRI released Version 2.4 of its database to researchers in December 2016, concurrent with the completion of this data description article.

This article provides an overview of the PCRI's data on private capital transactions, including both investments and exits. Please see Part 1¹ of this series (published in September 2015) for a more detailed look at

private capital firms, private capital funds, portfolio companies, and cash flows.

PCRI Data Sources

Data Collection from Private Capital Firms

A large part of the PCRI's vision involves obtaining data from the private capital firms themselves. To date, the PCRI has signed confidential agreements with over thirty general partners. These datasets represent over 267 funds and over 4,900 portfolio companies. Recently, the PCRI incorporated detailed cash flow information that was provided by the City of Zurich Pension Fund and spans over 150 private capital funds.

Gathering information directly from practitioners has its limitations. Even if every active firm chose to participate, there would still be a number of firms that have gone out of business. Therefore, the PCRI complements data from private capital firms with data from commercial sources.

¹ "Insights into the Private Capital Industry using the Private Capital Research Institute Database: Part 1: Data sources and Overview of Private Capital Firms, Funds, and Portfolio Companies", Private Capital Research Institute, September 11 2015

Data collection from other sources

Over the past year, the PCRI increased the number of major vendors and private capital associations from which it collects data from four to six. These contributors include the following: The Emerging Markets Private Equity Association, NYPPEX FundsIQ, Start-Up Nation Central, Thomson Reuters, *unquote*, and Venture Intelligence. Below is a brief description of these organizations:

Emerging Markets Private Equity Association

(EMPEA): EMPEA is an independent, non-profit global industry association for private capital in emerging markets. EMPEA has over 300 member firms, comprising institutional investors, fund managers and industry advisors, who together manage more than US\$1 trillion of assets and have offices in more than 100 countries across the globe. EMPEA's proprietary database of funds and investments is built from the ongoing support of its members, publicly available information, trade publications, and communication with industry participants and regional and local venture capital associations².

NYPPEX FundsIQ (NYPPEX): NYPPEX is a global securities firm specializing in secondary private market advisory, trading, credit facilities, principal investments and research for illiquid asset classes. The company provides access to private market liquidity for interests in private partnerships (e.g. buyout, venture, natural resources, real estate, hedge funds etc.), unregistered equity and debt related securities in private companies and their respective

derivative instruments³. NYPPEX collects detailed fund cash flow data from a variety of sources including public FOIA reports.

Start-Up Nation Central: Start-Up Nation is an independent non-profit organization focused on connecting international clients with Israeli companies that may have the people and technologies to help solve challenging business problems. As part of Start-Up Nation's efforts, it has created the largest, up-to-date database on Israeli private equity transactions and funds.

Thomson Reuters: Thomson Reuters is a leading source of financial and economic information for businesses and professionals. According to its website, Thomson Reuters is an originator, consolidator and value-add re-distributor of security and financial instrument data with hundreds of sources and partners. Through various acquisitions, Thomson Reuter's private capital database includes data from two former private capital data providers: Venture Economics and the Securities Data Company.

unquote: *unquote*, a division of Incisive Media, is a leading European private equity specialist and information source that has been researching the markets for over 20 years. *unquote* is a provider of information on deals, funds and exits - fully verifying the information directly with the private equity deal-doers, fund managers, institutional investors, and advisory communities. As its website notes: "with data from over 35,000 private equity investments stretching back to 1990, it is the

² From EMPEA's website: <http://empea.com/>

³ From NYPPEX's website: <http://nyppex.com/>

longest-running and most comprehensive European database available.”

The bulk of *unquote*'s data is derived from the Alternative Assets Division of Incisive Media which has been collecting in-depth, verified data on European PE investments since it was formed (originally as Initiative Europe Ltd) in mid-1988. According to *unquote*'s website, direct contact between its editors/researchers and private equity deal-doers, advisers, fundraisers and institutional investors is at the heart of its research methodology. This strong relationship and direct contact has enabled them to build a high-quality flow of information in its databases.

Venture Intelligence: Venture Intelligence is a leading source of historical information, back to as early as 1998, on private company financials, transactions (private equity, venture capital and M&A) and their valuations in India.

Data Cleaning Process

Most of the work at the PCRI involves cleaning and consolidating datasets from these sources, which can differ in size, completeness and reliability. The first step involves matching the names of private capital firms, funds, and portfolio companies across contributors in order to create unique identifiers within the PCRI database. A custom fuzzy matching algorithm facilitates this process by reducing the number of possible matches. But to ensure a high degree of accuracy, the final mappings are all done manually. There are also QA measures in place which regularly screen for inconsistencies.

Next, each of the remaining variables is brought into a standard format. This includes unit-adjusting numbers, converting local

currency amounts to dollars using historical exchange rates, and normalizing string variables using an ever-expanding library of definition mappings. During this step, the PCRI cross-references documentation and coordinates with vendors and PE firms to ensure that variables are consistently defined across various sources.

Once this process is complete, the data is appended into the respective files that are available to researchers. For duplicate and/or conflicting information, the PCRI has implemented a system that prioritizes the most reliable vendor, based on subjective criteria. This guarantees that only the highest quality data is included.

The last step involves researching missing information, often from additional sources. In some instances, information is inferred from existing data to try to increase completeness. For instance, a fund's geographic focus is sometimes determined by examining the regional composition of its portfolio companies.

Description of the Data

Investment and Deal Categories

Investment-level and deal-level information is provided in two separate tables. The investment-level data focuses on the private equity transactions by individual funds, wherein an investment event is characterized by a date, a portfolio company (the company receiving funds), and the fund which is making the investment. Investments must have full information on these three variables in order to be included. Only a small percentage of observations (approximately 5.5%) are dropped for missing a portion of this information.

The investment data file also includes the following variables: *gp_id*, the identifier of the private capital firm of a fund; *equity_invest_usd*, the US dollar amount of the equity bought by the fund (including options, warrants and convertible common stock); *investment_type* (buyout or vc etc.) and *investment_subtype*, a more refined classification of the investment type. See the Appendix of the manual for more details. The file also includes *exit_id*, an identifier which ties an investment to an exit, provided one has occurred. One reason for the lower completeness of the *exit_id* reflects the fact that many of the investments simply have not exited. Another reason for the lower completeness is that it is often challenging to tie an exit to an investment. Approximately 25% of our exits are not linked to an investment. We are currently researching these exits. The exit data file will be described in detail later in this article.

The deal category data, on the other hand, focuses on a combined set of investments by different funds into a single portfolio company. Deals are uniquely defined by a portfolio company and date combination, thus making up a superset of investments. Variables in this table contain general deal information such as: *deal_id*, the unique identifier of a deal; *deal_type*, which is similar to *investment_type*; *round*, a company's financing round; and *joint_invest*, a dummy variable which indicates whether a deal had multiple participants.

The deal table also includes information about the amount of financing received by the portfolio companies. The *pe_value* variable captures the total amount of capital provided by all participants of a deal. The *pe_equity* and *pe_debt* variables represent the equity and debt portions of this amount, respectively.

Lastly, the *tev* variable captures the total enterprise value of a company at the time of the transaction. The data on the *tev* variable is quite sparse, but it is included because the PCRI is actively researching this information. The investment and deal tables can be easily linked using the *deal_id* variable found in both tables. Tables 1.1 and 1.2 show the completeness of each of the variables in the investment and deal tables, respectively.

Table 1.1
Completeness of Investment Table

Variable	% Complete as of September 2016
Investment_id	100%
company_id	100%
deal_date	100
fund_id	100
gp_id	100
equity_invest_usd	76
investment_type	99
investment_subtype	99
deal_id	100
exit_id	34

Table 1.2
Completeness of Deal Table

Variable	% Complete as of September 2016
deal_id	100%
company_id	100
gp_id	100
date	100
fund_id	100
deal_type	97
pe_value	69
pe_equity	63
pe_debt	<1
tev	<1
round	94
joint_invest	99

Similar to the private capital fund and firm classification system described in our first article, the same five categories are used to classify private capital investments: *buyout*, *vc*, *growth equity*, *secondary*, and *others*. See definitions below. These classifications are determined by the original data sources as well as the PCRI's own research and deduction based on the associated portfolio companies. In addition, a new *investment_subtype* variable provides 28 more refined classifications.

Buyout Investments are investments in companies that are well established and mature in nature. A large part of these investments are leveraged buyouts (LBOs), transactions in which a fair amount of debt is used as part of the investment. More generally, this type of investment includes money raised for acquisitions and expansion, corporate carve-outs, industrial holding investments, private investments in public equity (PIPE), and secondary buyouts (i.e., buyouts of a private equity position by another private capital firm).

Venture Capital investments are investments in high-growth companies that are in the early stages of their business cycle (seed investments and start-up investments).

Growth Equity investments include the *expansion/growth* and *later stage* subtypes. The *growth equity* category lies somewhat in between buyouts and venture capital. This category is intended to capture investments that are expansion opportunities in more mature companies.

Second investments include the *lp interest* and *secondary purchase* subtypes. This category only includes sales to another LP and does not include a sale to another buyout or VC fund.

Other investments include *bridge loan*⁴, *direct*, *mezzanine*, *open market purchase*, *other*, *turnaround*, *project/infrastructure*, *real estate*, and *debt investment* subtypes.

Observations

Deal Types Over Time

Table 2 displays the number of deals over time by type. It is evident that buyouts and venture capital deals are typically the most dominant and that they have followed an inverse relationship.

Charts 1.1 and 1.2 provide the number and total US dollar amounts of investments each year by type, respectively. Based on the data,

⁴ These can also be provided by Venture Capitalists, but we currently do not have a way to distinguish. It is possible to identify by looking at size or the firm that receives the capital.

VC investments reached their peak in both number and size at the height of the dot-com bubble. Since then, the levels of VC dollar investments have come down considerably while buyouts and growth equity investments have increased.

Table 2
Percentage Number of Deals by Deal Type and
Time Period

deal_type	'90- '99	'00- '09	'10- '15	Total
Buyout	23%	24%	29%	26%
VC	51	48	44	47
Growth	19	22	19	20
Secondaries and other	7	6	8	7

Chart 1.1

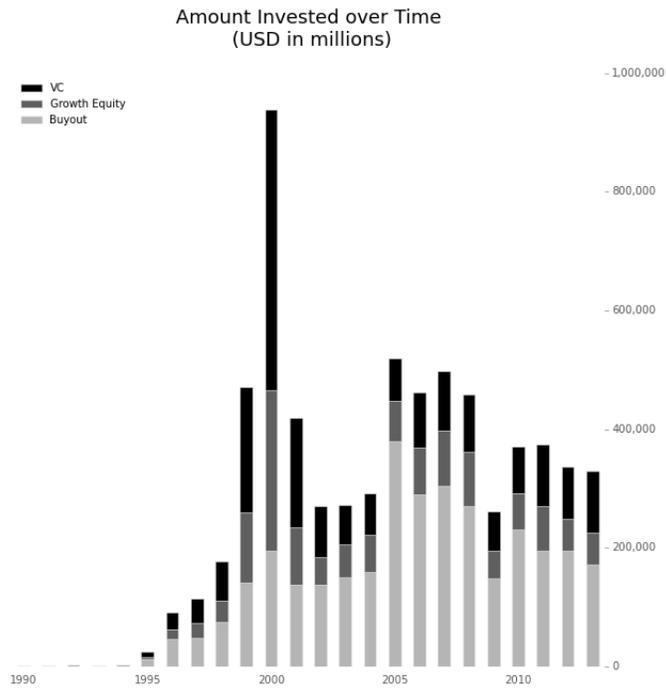
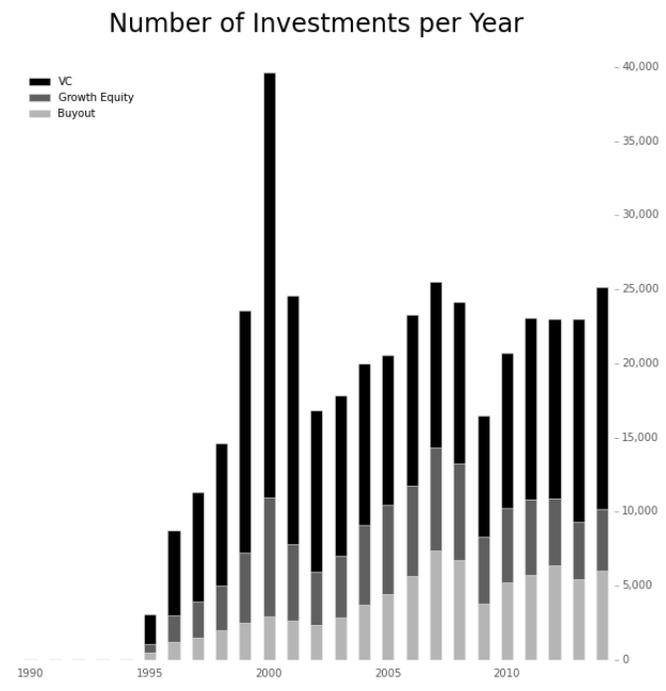


Chart 1.2



Jointly Invested Deals

If an investment is jointly made by more than one fund, each fund-portfolio company pairing is included as a separate line in the investment table. As mentioned above, each of these jointly invested deals is flagged with a *joint_invest* dummy equal to 1 (0 otherwise). Table 3 below provides information on the total number of investors in deals. Approximately 45 percent of transactions are jointly invested deals and 13 percent have more than four investors.

Table 3
Breakdown of the Number of Investors in a Portfolio Company

Number of Investors	Percent of portfolio companies
1	55%
2	22
3	10
4 or more	13

Geographic Distribution

Table 4 displays a breakdown of the geographic location of investments over time. The percentage of investments being made outside of the US and Europe has been growing over the past two decades. Asia, in particular, has increased its share of the market from 3 percent to 13 percent.

Table 4
Number of Investments by Region, Split by Investment year

Region	1990-99	2000-09	2010 – '15
Africa	0.26%	0.45%	0.63%
Asia	3.45	7.63	12.78
Europe	10.14	21.83	19.69
Middle East	0.73	1.67	2.34
North America ex US	8.51	6.14	4.93
Other (includes Antarctica, Eurasia, Oceanic, Mutigeography)	0.96	1.59	1.5
South America	0.41	0.47	0.90
United States	75.54	60.20	57.25

Industry Focus

Table 5 summarizes deals by industry. For simplicity, the industry-focus of funds and the industries of portfolio companies are based on the 17 National Venture Capital Association (NVCA) categories⁵. A multi-sector industry category has been created to capture funds or companies that have multiple overlaps in these categories.

In some cases, the PCRI is given either the Standard Industry Classification code (SIC), General Industry Classification codes (GIC - developed by Morgan Stanley's MSCI and Standard & Poor's), or a written business description. To resolve these discrepancies, custom mappings have been created between all three of these forms and the NVCA industry categories.

⁵ National Venture Capital Association 2014 Yearbook

Table 5
Deal Breakdown by Industry, split by Investment Year

NVCA Industry	1990-99	2000-09	2010 – 2015
Biotechnology	6.22%	8.31%	7.88%
Business Products and Services	5.10	5.26	4.40
Computer Software	18.53	17.67	21.63
Computers and Peripherals	2.30	1.53	1.06
Consumer Products and Services	7.48	6.22	7.66
Electronics/instrumentation	1.73	2.12	1.39
Financial Services	4.36	4.45	4.75
Health Services	3.35	2.41	3.02
Industrial/Energy	14.60	16.41	16.96
IT Services	4.89	4.91	6.77
Media/Entertainment	7.99	7.74	8.80
Medical Devices and equipment	4.95	4.79	5.00
Multi-Sector	0.02	0.02	0.05
Networking and Equipment	3.22	2.98	0.78
Other	1.52	2.02	1.99
Retailing/Distribution	3.64	2.92	3.60
Semiconductors	2.39	3.57	1.85
Telecommunications	7.71	6.69	2.41

Exit Characteristics

The exit table consists of information on exit transactions from data providers, data collected by PCRI researchers, and IPO information from the Kenney-Patton database.⁶ The PCRI database contains over

44,740 exits. An exit is only included if there is information on the private capital firm involved, the exit date and the portfolio company. As with the investment table, this constraint results in only a small percentage of exits dropping out of the database. Other variables included are: *exit_amount_usd*, the total size of the exit consideration in millions of dollars; *exit_type_id*, the exit category (see

⁶ Kenney-Patton Firm and Management Database of Emerging Growth IPOs: 1990-2010. This database is comprised of all emerging growth initial public offerings (IPOs) on American stock exchanges and filed with the Securities and Exchange Commission (SEC) from January 1990 through December 2010. From this list the following types of firms and filings were excluded: mutual funds, real estate investment trusts (REITs), asset acquisition or blank check companies, foreign F-1 filers, and all spin-offs and other firms that were not true emerging growth firms. This database contains variables that pertain to the firm going public and the offering itself. Each firm is assigned a Central Index Key by the SEC which we are using as the firm's unique identifier. All of the variables in this database are extracted from each firm's

prospectus (form 424B) or the firm's registration statement (form S-1). The data is found in two Excel databases. The Firm IPO database contains data on the firm such as company name, location of headquarters, initial share price, year of founding and SIC. This database has information on 3,939 individual firms. The Management and Director database contains the name, age, position, and biography of all of the managers and directors of these firms. This database has information on 43,695 individuals, each of whom is uniquely identified.

below) and *exit_listing_exchange*, if applicable. The completeness of these variables is displayed in Table 6.

Table 6
Exit Data Coverage

Variable	% Complete as of September 2015
exit_id	100%
company_id	100
gp_id	100
date	100
exit_amount_usd	51
exit_type	98
exit_status	78
exit_listing_exchange	36*

*As a proportion of IPO's.

Exits are classified into five categories: *acquisition*, *assumed failure*, *initial public offerings (ipo)*, *defunct*, *other*. Below is a description of each category.

Acquisition includes the financial or strategic sale of a portfolio company to another entity. This category also includes instances in which a portfolio company is sold to another buyout firm (secondary buyout) or a limited partner is selling its ownership to another limited partner (secondary sale). This also includes buy-backs and open-market sales of holdings.

Assumed Failure is a category generated by the PCRI. A portfolio company that does not exit ten years after its last funding round is assumed to have failed.

Defunct category includes portfolio companies that declare bankruptcy or are written off as a loss.

Initial Public Offering (IPO) is an exit through the public markets.

Other includes dividends, restructures such as dividend recapitalizations and refinancing, and all other distributions.

Table 7 below provides a breakdown of exit types by investment strategy. The majority of exits are acquisitions. While buyouts, growth equity and VC investments are typically exited through an acquisition (54%), buyouts are more likely to exit via this method at a rate of 63%. Growth equity and VCs come in at 45% and 52%, respectively. These two types of investments are, however, more likely to result in IPO's at rates of 20% for growth equity and 15% for VC's, as compared to 10% for buyouts.

As mentioned above, a mapping also exists between the investment and exit tables. The variable *exit_id* allows researchers to merge the two tables and see all possible investments leading up to a particular exit. This opens the door to look at the many factors contributing to specific exits. Of the 44,740 exits, only 11,809 or about 20% of all exits do not have a matching investment. Our next article (Part 3) will focus more closely on calculating a return number and look at private capital investment performance.

Table 7
Exits Percentages by Type of Investment
1980-Present

	Buyout		Growth Equity		VC		Total	
Acquisition	5,164	63%	1,622	45%	8,364	52%	15,150	54%
Assumed Failed	1,421	17%	906	25%	4,474	28%	6,801	24%
Defunct	239	3%	121	3%	625	4%	985	4%
IPO	836	10%	702	20%	2,393	15%	3,931	14%
Other	501	6%	231	6%	234	1%	966	3%
Total Exits	8,161	28%	3,582	27%	16,090	26%	27,833	27%
No exit	21,501	72%	9,551	73%	45,597	74%	76,649	73%
Total	29,662		13,133		61,687		104,482	

Conclusion

The PCRI database is arguably one of the most comprehensive sources of information on private capital firms and transactions. By relying on direct contributions from private capital firms and supplementing them with data from commercial vendors, the PCRI has created a database that is both highly accurate and comprehensive. The PCRI continues to improve as it expands its outreach efforts to private capital firms, receives quarterly updates from third-party sources, and fills in missing observations using public resources such as government filings.

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