

# **The Bright and Dark Side of Staging**

## **Investment Performance & the Varying Motivations of Private Equity Firms**

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# Content

- I. Motivation: Staged Financing and Investment Returns
- II. Creation of a unique dataset
- III. Analyses and Interpretation of Results
- IV. Conclusion



## Definition

- Staging is the stepwise allocation of capital from an investor to a company – contrary to upfront financing
- In Private Equity and Venture Capital Financing, staging is a common tool to mitigate information asymmetries and agency problems

## Importance

- Several studies have confirmed the importance of staging as an instrument to control and monitor an investment and to have impact on its performance

## Puzzle

- Recent studies have shown **conflicting results**: some show evidence for positive and others for negative influence of Staging on performance

## Motivation

- Solving the puzzle empirically:  
Does Staging have positive or negative influence on the return on investment?



Citing **positive** influence of Staging on performance:

## Theoretical studies

- Wang and Zhou (2004, Journal of Corporate Finance)
- Hsu (2002, Working Paper, National Taiwan University)
- Neher (1999, The Review of Economic Studies)
- Chan (1983, Journal of Finance)

## Empirical studies

- Gompers (1995, Journal of Finance)
- Sahlmann (1990, Journal of Financial Economics)

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Citing **negative** influence of Staging on performance:

## Theoretical studies

- Wang and Zhou (2004, Journal of Corporate Finance)
- Cornelli and Yosha (2003, Review of Economic Studies)
- Kahl (2002, Journal of Finance)
- Bergemann and Hege (1998, Journal of Banking & Finance)

## Empirical studies

- Hege, Palomino and Schwienbacher (2003, Working Paper, HEC Paris)



## **The Puzzle might be explained by studying WHEN staging is used during the life of investment relationship**

- Start: High information asymmetries  
Agency problems  
⇒ Staging as tool to mitigate problems
- End: Termination dilemma for losers:  
Exercise of option to abandon losers  
foregoes the turnaround option  
⇒ Staging as a wait and see option

Approach: Empirical Analyses at Start and End of Investment Relation



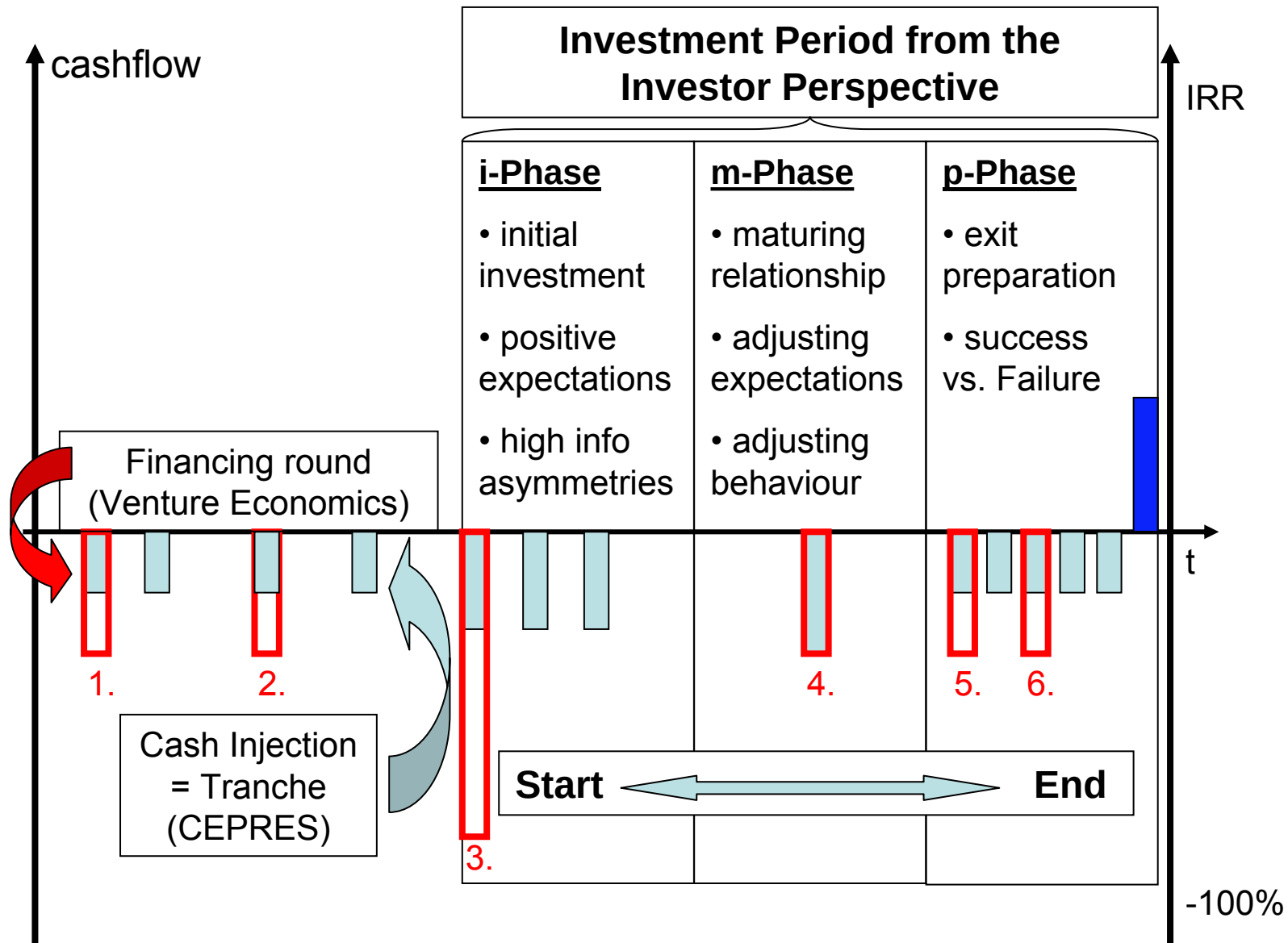
## Varying motivations and staging behaviour during the investment relationship:

- Hypothesis 1: *Start*

Staging is *positively* associated with investment performance  
(Mitigation of information asymmetries and agency problems)

- Hypothesis 2: *End*

Staging is *negatively* associated with investment performance  
(applied in critical situations, „gambling for resurrection“)



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Creation of a unique dataset by **merger of two databases**

| Databases              | Venture Economics | CEPRES  | Merged Dataset |
|------------------------|-------------------|---------|----------------|
| Investment Firm        | ✓                 | ✓       | ✓              |
| PE/VC Fund             | ✓                 | ✓       | ✓              |
| Portfolio-Company Name | ✓                 | ✓       | ✓              |
| Financing Rounds       | ✓                 | n/a     | ✓              |
| Tranches               | n/a               | ✓       | ✓              |
| Cashflows              | n/a               | ✓       | ✓              |
| Objectivity            | Self-reported     | Audited | ✓              |
| Staging -> IRR         | n/a               | n/a     | ✓              |

=> exact measurement of performance using precisely dated cashflow information

=> exact measurement of staging on the basis of rounds and tranches (= fraction of a round)

=> **precise analyses of the impact of Staging on Return on Investment (IRR)**



**Matching of Databases:** Congruent Information in both Databases at four levels

1. Investment Manager Name
2. Fund Name
3. Portfolio Company Name
4. Date of initial investment

**Matching result: 1,774 investments**

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**Sample Selection:** Reduction of sample in three steps

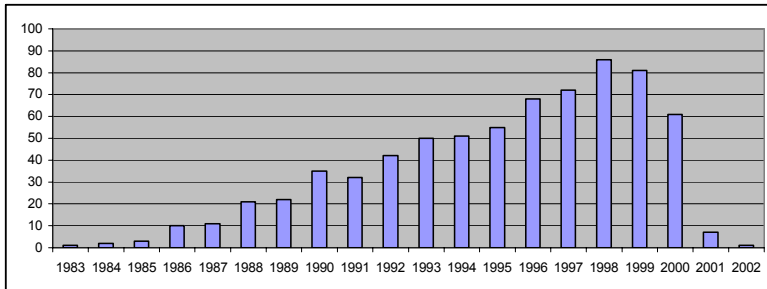
1. Focus on fully- and partially realized investments => **1,011 investments**
2. only partially realized investments with  
=> **789 investments**
3. Double counting reduction => **Selection result:**

**712 investments by 122 PE /VC funds belonging to 51 investment firms;  
including 2,329 cash injections (tranches) and 1,549 financing rounds**

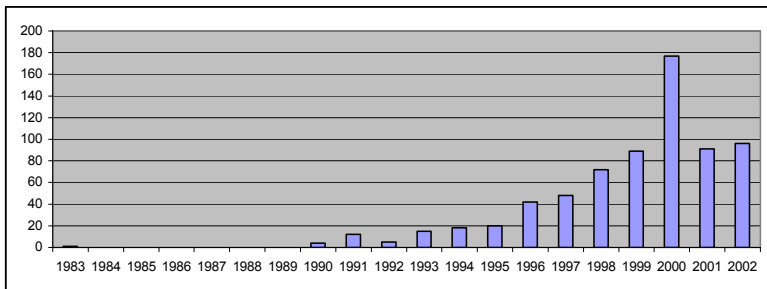


## Distribution over Time

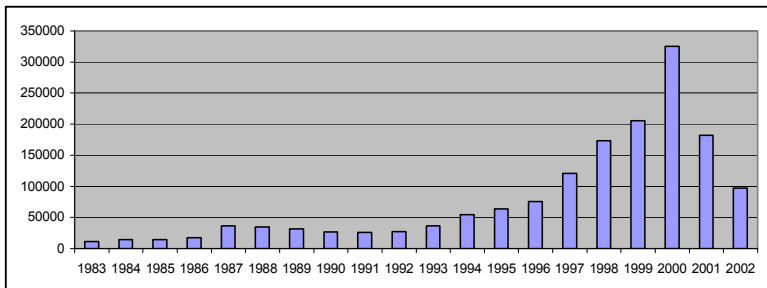
Number of Investments per Year



Number of Exits per Year



Committed Capital on the overall market per Year

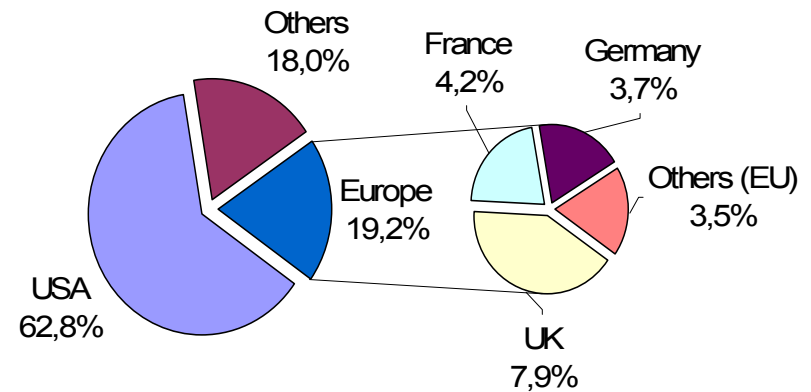


Source: Venture Economics

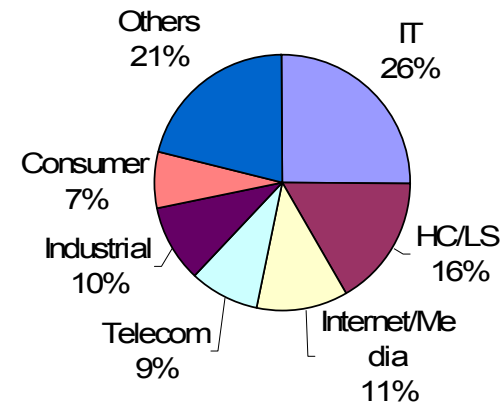
1983

2002

## Geographic Distribution



## Sector Distribution



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- Staging is possible even *within* rounds due to segmentation into Tranches
- The Investor has the Option to abandon a non performing project at each Tranche

| Round- Cluster   | No.of Tranches |      |        |           |      |              |
|------------------|----------------|------|--------|-----------|------|--------------|
|                  | N              | Mean | Median | Std. Dev. | Max. | % of Total N |
| 1 Round          | 370            | 2,05 | 1      | 1,71      | 12   | 53,10%       |
| 2 Rounds         | 141            | 3,11 | 3      | 1,82      | 9    | 20,20%       |
| 3 Rounds         | 65             | 4,12 | 4      | 2,44      | 18   | 9,30%        |
| 4 Rounds         | 48             | 5,04 | 5      | 2,46      | 14   | 6,90%        |
| 5 or more Rounds | 73             | 7,77 | 7      | 3,58      | 18   | 10,50%       |
| Total            | 697            | 3,26 | 2      | 2,77      | 18   | 100,00%      |



- Differences in staging between i-phase and p-phase
- Especially different between successful and non-performing companies

|                          | i-Phase<br>Tranches | p-phase<br>Tranches | i-Phase<br>amount* | p-phase<br>amount* | TTR  |
|--------------------------|---------------------|---------------------|--------------------|--------------------|------|
| <b>Exit Type Cluster</b> |                     |                     |                    |                    |      |
| IPO                      | 1,76                | 0,21                | 10.219,73          | 158,21             | 1,81 |
| Sale/Merger              | 2,06                | 0,41                | 14.676,33          | 1.132,06           | 1,94 |
| Write Off                | 1,58                |                     | 6.773,09           |                    | 2,27 |
| else/not specified       | 2,30                | 0,21                | 20.433,53          | 1.660,95           | 1,91 |
| <b>IRR Cluster</b>       |                     |                     |                    |                    |      |
| IRR<=0                   | 1,95                |                     | 9.097,68           |                    | 2,26 |
| IRR> 0                   | 1,97                | 0,25                | 16.978,71          | 1.249,83           | 1,75 |

\* all amounts in real 2003 thousand U.S.Dollars

- Staging is used as control instrument – especially in critical situations
- However, the option to abandon nonperforming projects is not rigorously applied



## **Measurement of performance (dependant variable)**

- Absolute IRR (Cash Flows between investor and company)
- Excess IRR (over simultaneous investment in benchmark index)

## **Measurement of staging behaviour**

- Two levels: rounds and tranches
- Three phases
- in absolute and relative terms (phase values in relation to the total investment period)
- several measures (number, frequency, duration, amount and timing of investments)

## **Further control variables on four levels of information**

(Investment management firm-, fund-, company- and market-level)



## Regression Analyses

| Performance measured by IRR |               |              |
|-----------------------------|---------------|--------------|
|                             | i- Phase      | p- Phase     |
| Constant                    | -0,914***     | -0,017       |
| TTR                         | 0,001         | -0,0003      |
| Pi Amount-share             | 0,746***      |              |
| Pp Amount-share             |               | -1,319***    |
| Pi Round-share              | 0,18**        |              |
| Pp Round-share              |               | -0,412***    |
| US-IM                       | 0,062         | -0,041       |
| VC-Fund                     | 0,162**       |              |
| No.of IM                    | -0,003        | -0,003       |
| IPO                         | 0,417***      | 0,299***     |
| Age of Company              | -0,001        | -0,003       |
| High Tech                   |               | 0,135**      |
| Later Stage                 |               | 0,209***     |
| Use of Convertibles         | 0,288***      | 0,148*       |
| No. Of IPOs                 | -0,0004       | -0,0001      |
| Comitted Capital            | -1,373E-06*** | -1,35E-06*** |
| Rsquare                     | 0,262         | 0,352        |
| Adjusted Rsquare            | 0,246         | 0,328        |
| F Statistic                 | 16,133 ***    | 14,833***    |

More staging during **i-phase**  
has **positive** impact on IRR

More staging during **p-phase**  
is **negatively** associated  
with IRR



## Interpretation of Regression Results

**Positive** impact of staging on return during **i-phase** can be explained by:

- high information asymmetries during beginning of investment relationship
- argument of Hsu (2002); Neher (1999); Gompers (1995), Sahlmann (1990); Chan (1983)

**Staging reduces information asymmetries + agency costs**

**Negative** association of staging with return during **p-phase** could be explained by sunk cost in critical situations:

- Kahl (2002): **Termination Dilemma**
- Bergemann and Hege (1998): **Learning costs**
- Lakonishok (1991): **Window Dressing**



## Robustness Tests

Analyses for dataset subsamples:

- Funds focused on venture capital investments only
- early versus later stage investments
- US- versus Non-US-Investments
- Investments before versus after the internet bubble
- Investments where the fund manager was the lead investor versus non-lead
- Investments where the fund manager had observer rights



**All analyses confirm the hypotheses**

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## Contribution:

- a) Recognizing the puzzle of positive and negative influence of staging
- b) Phase approach to analyze influence at start and end of relationship
- c) Creation of unique dataset by merger of two comprehensive databases
- d) Accurate measurement of staging based on rounds and tranches
- e) Precise calculation of return on investment (IRR) based on cash flows

### Solution to puzzle in previous studies - **Bright and Dark side of Staging:**

- **Staging has positive influence on IRR** during the initial investment phase due to mitigation of information asymmetries and agency problems
- **Staging is negatively associated with returns** during pre-exit phase as investors do not use staging as an option to abandon nonperforming projects rigorously; they appear to use staging in critical situations for turnaround attempts or for window dressing purposes



# Thank You

